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BRUCE GS "B"
COMMISSIONING BIOLOGICAL STUDY
YEAR III, 1985 - AQUATIC STUDIES

D.W. Rodgers and H.Balesic
Biological Research Section
Chemical Research Department

ABSTRACT

Studies of the aquatic environment in the vicinity of Bruce GS "B" were conducted from April to December, 1985. In 1985, a slight increase in the temperature (approximately 1°C) of surface waters at the Bruce GS "B" discharge station was observed during summer stratification. As in other years, however, the thermal regime during summer stratification was highly unstable, with large temperature fluctuations caused by episodes of upwelling and downwelling. These fluctuations are characteristic of exposed nearshore environments of the Great Lakes. Water quality parameter values and sediment composition were generally similar to previous years. Catches of adult and juvenile fish were also similar to earlier preoperational and commissioning surveys. Alewife predominated in the catch, followed by yellow perch, longnose sucker, spottail shiner and white sucker. The proportion of yellow perch increased to approximately 20% of the total catch as compared to less than 12% in previous surveys. As in earlier surveys, ichthyoplankton densities varied seasonally, with smelt and burbot dominating collections in the spring and early summer and large numbers of alewife larvae appearing later in the summer. In general, the estimated densities of burbot larvae in the Bruce GS "B" forebay were greater than open lake samples, while the estimated densities of smelt and alewife larvae were lower in the Bruce GS "B" forebay samples.

job	file	date	report no.
34-105-492	837.321	March 29, 1988	87-306-K

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EXECUTIVE SUMMARY

BRUCE GS "B" COMMISSIONING BIOLOGICAL STUDY
YEAR III, 1985 - AQUATIC STUDIES

D.W. Rodgers and H.Balesic
Biological Research Section
Chemical Research Department

At the request of the Environmental Studies and Assessments Department, Design and Development Division, studies of the aquatic environment in the vicinity of Bruce GS "B" were conducted from April to December, 1985. In 1985, Units 5 and 6 of Bruce GS "B" operated at a net capacity factor of about 86%. This is the third year of studies of the aquatic and terrestrial environments in the vicinity of Bruce GS "B" during the commissioning period (1983-1986). The objectives of the studies were:

i) to provide continuity between preoperational (1979-1983) and post-operational (1987-1989) studies, and

ii) to identify significant environmental changes resulting from construction or station operation during commissioning.

Nearshore water temperatures increased from less than 5° C in April to a maximum of approximately 23° C in August, then decreased to 5° C or less from mid-November on. During summer stratification the temperature differential between the 2 and 5 m depths at the Bruce GS "B" discharge station was approximately 1° C greater than in 1984. From mid-July into October, surface water temperatures at the discharge station were generally 1-2° C greater than the corresponding temperatures off Gunn Point. These temperature differences presumably resulted from the Condenser Cooling System heating the intake water to temperatures above the ambient surface temperature when the the summer thermocline was depressed below the Bruce "B" GS intake. As in other years, however, the thermal regime during summer stratification was highly unstable, with large temperature fluctuations caused by episodes of upwelling and downwelling. These fluctuations are characteristic of exposed nearshore environments of the Great Lakes.

job	file	date	report no.
34-105-492	837.321	March 29, 1988	87-306-K

The values of water quality parameters were generally similar to those observed during earlier preoperational and commissioning surveys. The elemental composition of sediments collected in sediment tubes was also consistent with samples collected during preoperational studies and concentrations of heavy metals in the sediments were low.

In general, catches of adult and juvenile fish were similar to those of earlier preoperational and commissioning surveys. Alewife predominated in the catch, followed by yellow perch, longnose sucker, spottail shiner and white sucker. The proportion of yellow perch increased to approximately 20% of the total catch as compared to less than 12% in previous surveys. Ichthyoplankton densities varied seasonally, with smelt and burbot dominating collections in the spring and early summer and large numbers of alewife larvae appearing later in the summer. These patterns were also consistent with previous surveys. In general, the estimated densities of burbot larvae in the Bruce GS "B" forebay were greater than open lake samples, while the estimated densities of smelt and alewife larvae were lower in the Bruce GS "B" forebay samples.

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To Dr. W.R. Effer
Manager, Environmental Studies and Assessments
Design and Development Division

BRUCE GS "B" COMMISSIONING BIOLOGICAL STUDY
YEAR III, 1985 - AQUATIC STUDIES

1.0 INTRODUCTION

Bruce GS "B" is a 3200 MW nuclear generating station on the north-east shore of Lake Huron. It is a part of the Bruce Nuclear Power Development (BNPD) which also includes Bruce GS "A", the Douglas Point Reactor and the Bruce Heavy Water Plant. In 1985, two units of Bruce GS "B", Units 6 and 5, operated at a net capacity factor of about 86%, while Units 7 and 8 were not in operation. The power history of Bruce GS "B" in 1985 is presented in Figure 1.1.

The Bruce GS "B" commissioning studies are part of a series of environmental studies at the site, which began with the Environmental Assessment incorporated in the proposal for Bruce GS "B" (1975) and will end with the final Environmental Assessment projected for 1990. This report summarizes the results of aquatic studies in 1985, which consisted of monitoring of selected physical and chemical parameters of the water and sediment and sampling of larval, juvenile and adult fish in the vicinity of Bruce GS "B" .

2.0 METHODS

From April to December, 1985, samples were collected from the study area, which extended from the Bruce GS "A" intake in the north to Gunn Point in the south (Figure 2-1). Sampling locations and transects were generally similar to those used in earlier surveys (Ontario Hydro Research Division (OHRD) Report No. 83-182-K; OHRD Report No. 83-451-K; OHRD Report No. 86-166-K). A summary of the sampling program is given in Table 2-1. Because of the 1985 OHEU strike, no sampling was conducted for the period May 6-18, 1985.

2.1.1 Water Temperature, Currents and Chemical Characteristics

From April to December, 1985, continuous water temperature and current monitors were maintained at a number of locations off the BNPD by the

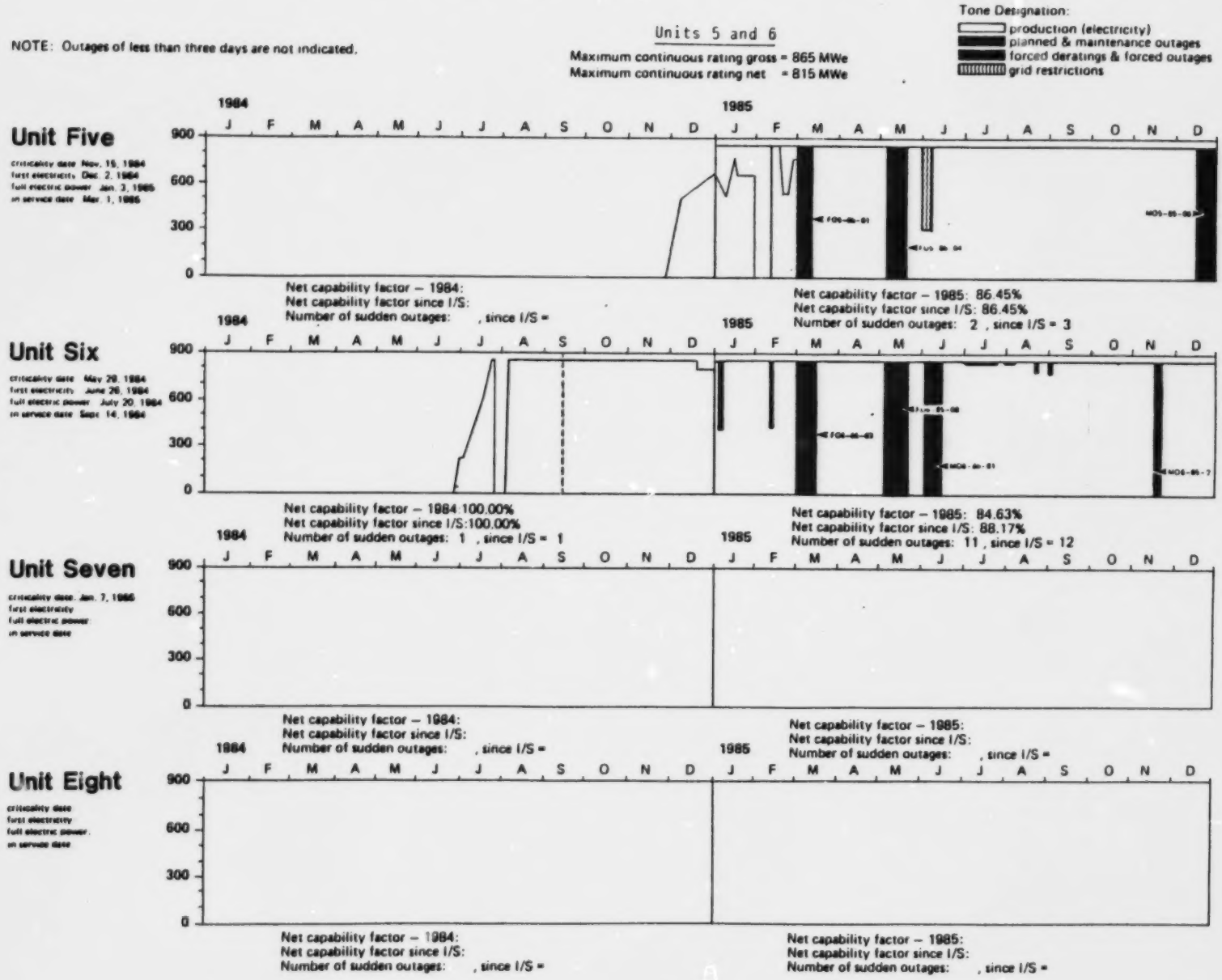
NOTE: Outages of less than three days are not indicated.
Units 5 and 6
Maximum continuous rating gross = 865 MWe
Maximum continuous rating net = 815 MWe
Tone Designation:
production (electricity)
planned & maintenance outages
forced deratings & forced outages
grid restrictions
Unit Five
criticality date Nov. 15, 1984
first electricity Dec. 2, 1984
full electric power Jan. 3, 1985
in service date Mar. 1, 1985
1984
1985
J F M A M J J A S O N D J F M A M J J A S O N D
900
600
300
0
Net capability factor – 1984:
Net capability factor since I/S:
Number of sudden outages: , since I/S =
Net capability factor – 1985: 86.45%
Net capability factor since I/S: 86.45%
Number of sudden outages: 2 , since I/S = 3
Unit Six
criticality date May 29, 1984
first electricity June 26, 1984
full electric power July 20, 1984
in service date Sept. 14, 1984
Net capability factor – 1984:100.00%
Net capability factor since I/S:100.00%
Number of sudden outages: 1 , since I/S = 1
Net capability factor – 1985: 84.63%
Net capability factor since I/S: 88.17%
Number of sudden outages: 11 , since I/S = 12
Unit Seven
criticality date Jan. 7, 1986
first electricity
full electric power
in service date
Net capability factor – 1984:
Net capability factor since I/S:
Number of sudden outages: , since I/S =
Net capability factor – 1985:
Net capability factor since I/S:
Number of sudden outages: , since I/S =
Unit Eight
criticality date
first electricity
full electric power
in service date
Net capability factor – 1984:
Net capability factor since I/S:
Number of sudden outages: , since I/S =
Net capability factor – 1985:
Net capability factor since I/S:
Number of sudden outages: , since I/S =

FIGURE 1.1
LAKE HURON - BRUCE NPD
POWER HISTORY FOR BRUCE NGS "B" 1984 - 1985

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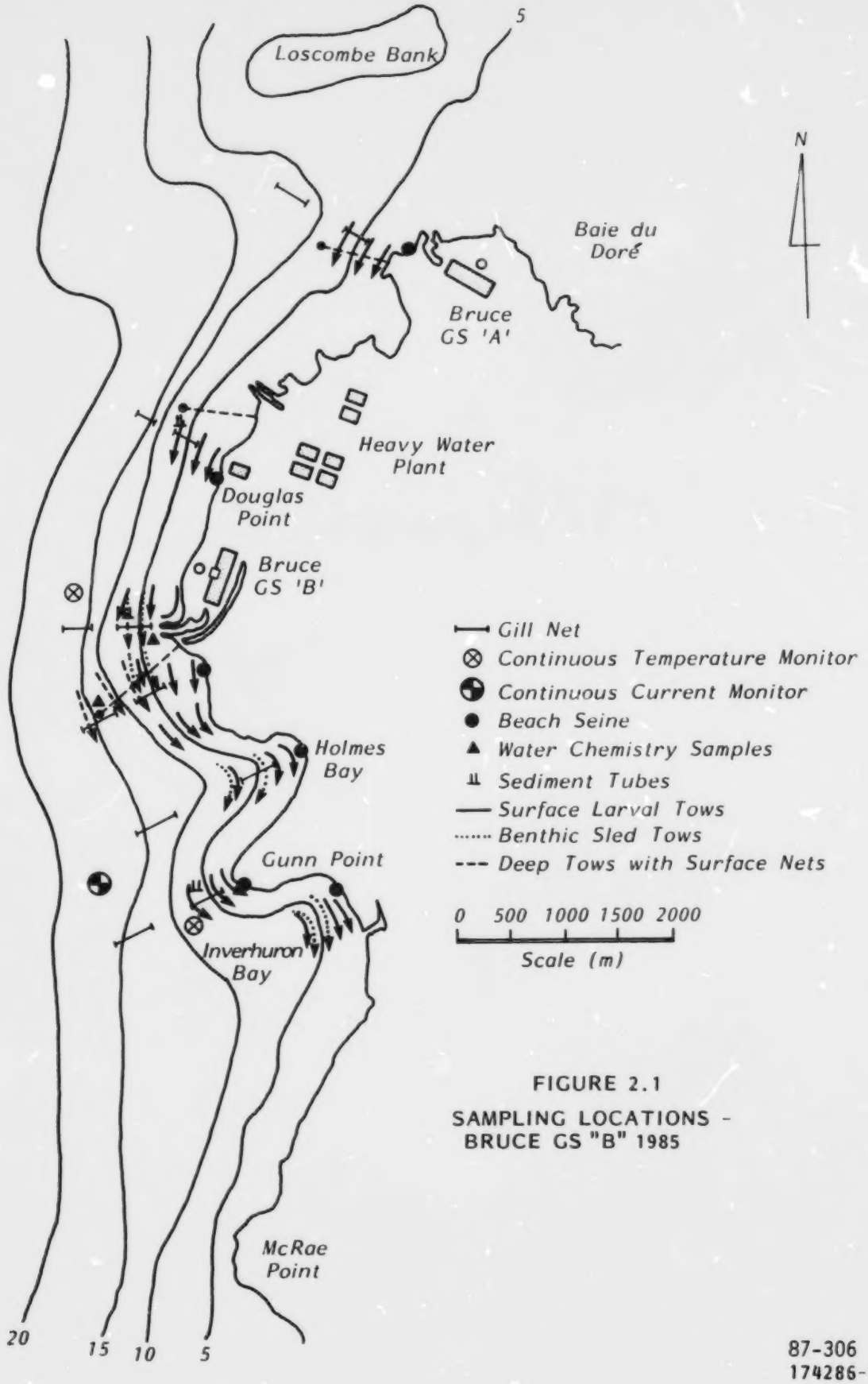

FIGURE 2.1

SAMPLING LOCATIONS - BRUCE GS "B" 1985

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TABLE 2-1

SAMPLING SCHEDULE, BRUCE GS "B", 1985

Parameter	Month								
	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Temperature and Current Monitors	x	—	—	—	—	—	—	—	x
Water Chemistry			x		x		x		
Sediment Chemistry			x	—	x	—	—	x	
Fish:									
Gill Nets		x	x	x	x	x	x	x	x
Beach Seines		x	x	x	x				
Larval Fish:									
Benthic Sled	x								
Bottom Tows		x	—	—	—	x			
Surface Tows		x	—	—	—	x			

(C57)

Geotechnical and Hydraulic Engineering Department, Design and Development - Generation Division (Ontario Hydro Design and Development Division (OHDDD) Report No. 86180). Thermographs TH-B02-2 and TH-B06-12 were placed at depths of 2 and 12 m, respectively, on a station situated at the 18 m depth contour just off the Bruce "B" discharge (Figure 2.1). Thermograph TH-B07-2 was located approximately 500 m off Gunn point at a depth of 2 m in water approximately 9 m deep. Current data were obtained from a current meter (CM-19-08) located approximately 1 km off Gunn Point at a depth of 8 m in water 18 m deep.

Water samples for chemical analysis were collected from the Bruce GS "B" intake transect (surface and bottom) and the Bruce GS "B" discharge transect (surface), on three dates during the open water period (June 6, August 8 and November 1, 1985). Water samples were collected by Van Dorn Bottles, treated as required and then stored for subsequent analysis. Samples were analyzed by the Analytical Services Section, Chemical Research Department for pH, color, conductivity, alkalinity, non-filterable residues (volatile and non-volatile), filterable residues (volatile and non-volatile), total and soluble phosphorus, orthophosphate, total and soluble silica, total Kjeldahl nitrogen, nitrite nitrogen, nitrate nitrogen, ammonia, calcium, aluminum, potassium, dissolved iron, sodium, sulphate, chloride, magnesium and oil and grease. Hardness was calculated from calcium and magnesium values.

2.1.2 Sediment Collection - Sediment Chemistry

Sedimented materials were collected in sediment traps placed at the 7 m depth contour at Douglas Point, Bruce GS "B" discharge and Gunn Point. The traps consisted of four PVC tubes (5 cm inside diameter, 63 cm long) supported by a metal stand in a vertical position with the open end up (OHRD Report No. 83-182-K). In 1985, the tubes were set on June 20, retrieved and reset on August 28-29, then retrieved on November 11. Samples were not collected from Douglas Point during the August-November collection period because the sediment tubes were upset by storms.

Elemental analysis of the sediment samples was conducted by the Analytical Services Section of the Chemical Research Department. For many elements, the sedimented materials were analyzed by two separate procedures, neutron activation analysis (NAA) and atomic absorption analysis (AAA). NAA, which was used in previous sediment analysis (OHRD Report No. 83-182-K), provides a measurement of the total amount of the element in the sample. AAA was conducted after a digestion of the samples as specified by the Ontario Ministry of Environment. This digestion may not extract the total amount of element into solution as some of the element may still be locked in the sediment matrix. However, the measurement of the metals released by these digestion procedures provides an estimate of the 'available' proportion of the element, which may be of greater environmental significance than the 'total' amount of the element (OHRD Report No. CE86-1342-K). Elements analysed by both AAA and NAA were: calcium, iron, aluminum, titanium,

manganese, chromium, cesium, barium, vanadium, cobalt, arsenic and selenium. Sulphur, strontium, zinc, copper, nickel, lead, cadmium, and mercury were only analyzed by AAA after digestion. NAA alone was used for analysis of sodium, rubidium, bromine, lanthanum, scandium, thorium, samarium, beryllium, ytterbium, antimony, eurnpium, hafnium, tanatalum, terbium and lutetium.

2.2 Adult and Juvenile Fish

Adult and juvenile fish were collected from nearshore waters by gill nets and from shallow waters by beach seine (Figure 2-1). Gill nets were fished monthly from April to December, for two consecutive 24 h intervals. The experimental gill nets consisted of nine 15.2 m panels with mesh sizes ranging from 2.5 cm (1 inch) to 12.7 cm (5 inch). Nets were set on the bottom perpendicular to the shore at the 3 and 12 m depth contours on transects located off the Bruce GS "A" intake, Douglas Point, Bruce GS "B" discharge, Bruce GS "B" intake, Holmes Bay and Gunn Point. Water temperature was measured at the surface, bottom and 2 m above the bottom of the inshore and offshore ends of each gill net during setting and retrieval. The August 28 - Bruce GS "B" intake transect and all inshore (3m) sets on September 24 were discarded because the nets were damaged by storms. In addition, adverse weather conditions forced an extension of the offshore (12 m) set of September 24 to 72 h at all locations, and prolongation of the second net set in November to 48 h at all locations.

As in previous years trout, salmon, whitefish, walleye and smallmouth bass were weighed and measured (fork-length) and a scale sample taken. These data will be incorporated in the commissioning summary report.

Monthly seine collections were conducted at Bruce GS "A" intake, Douglas Point, Bruce GS "B" intake, Inverhuron Bay and Holmes Bay transects from May to July. Adverse weather prevented sampling in August and September. Triplicate beach seine hauls were made after dusk, using a 15 m (50 ft) seine with 0.63 cm (1/4 in) mesh. Catches were preserved in 10% formalin and returned to the laboratory for identification.

2.3 Ichthyoplankton

Ichthyoplankton were sampled using the benthic sled, and tows with plankton nets in surface or bottom waters. Surface tows with plankton nets sampled pelagic larvae, while the benthic sled and bottom tows with plankton nets were used to sample demersal larvae (OHRD Report No. 83-531-K). Benthic sled tows were made in April during the day at four locations, Bruce GS "B" Intake (April 12 and 26), Bruce GS "B" Discharge (April 12, 24 and 26), Holmes Bay (April 12, 24 and 26) and Inverhuron Bay (April 12). From May to September, monthly surface tows were conducted at night on two consecutive days at eight locations, from the Bruce GS "A" discharge in the north to Inverhuron Bay in the south (Figure 2.1). September sampling was limited to one day because of adverse weather conditions. Duplicate surface tows were

made parallel to the shore along the 1, 3 and 7 m depth contours at each transect. In addition, duplicate bottom tows were collected along the 7, 12 and 16 m depth contours at the Bruce GS "B" intake transect. In surface and bottom tows, two conical nets (363 um mesh) were towed for 5 minutes, with the direction of the tows contingent on prevailing winds. General Oceanics current meters mounted at the mouth of each net were used to determine sampling volume. As in previous surveys (OHRD Report No. 83-507-K), estimated volumes did not vary appreciably among samples and a standard volume of 35 m^3/tow was used to compute larval densities. On each sampling date, ichthyoplankton were also collected from the Bruce GS "B" intake forebay by suspending duplicate 0.5 m nets at approximately 1 m depth in the forebay for 5 minutes, during which approximately 11 m^3 of water were sampled. Ichthyoplankton samples were preserved in 10% formalin and returned to the laboratory for identification.

3.0 RESULTS AND DISCUSSION

3.1 Water Temperature and Currents

The average daily water temperatures at three recording thermographs in the Bruce "B" study area from the end of April through December, 1985 are shown in Figure 3.1. Thermographs TH-B02-2 and TH-B06-12 were placed at depths of 2 and 12 m, respectively, on a station situated at the 18 m depth contour just off the Bruce "B" discharge (Figure 2.1). At the station off Gunn point, the thermograph (TH-B07-2) was located at a depth of 2 m in water approximately 9 m deep. In addition, water temperatures at a number of locations in the vicinity of BNPD in 1984 and 1985 have been compiled in OHDDD Report No. 86180.

In 1985, water temperatures increased from less than 5° C in April, to maximum temperatures of approximately 22° C in early August-September (Figure 3.1). Thermal stratification was apparent as the water warmed, with the greatest temperature differentials observed from July through mid-September. During stratification in 1985, the temperature differential between the 2 and 5 m depths at the discharge station (TH-B02-2 and TH-B22-5) was 1-3° C which represented an increase from the mean differential of approximately 1° C observed in 1984 (OHDDD Report No. 86180). This increase in temperature differential presumably resulted from the influence of the thermal plume of Bruce GS "B" with Units 5 and 6 in service (OHDDD Report No. 86180).

From late April through mid-July, temperatures in surface waters at the Bruce "B" discharge station (TH-B02-2) were generally similar to temperatures at the station off Gunn Point (TH-B07-2), but from mid-July into October, temperatures at the discharge station were approximately 1-2° C greater than the corresponding temperatures off Gunn Point (Figure 3.1). The differences in surface water temperature between locations likely resulted from the depression of the thermocline below the level of the Bruce "B" intake (10 m) as the summer progressed, at which time intake

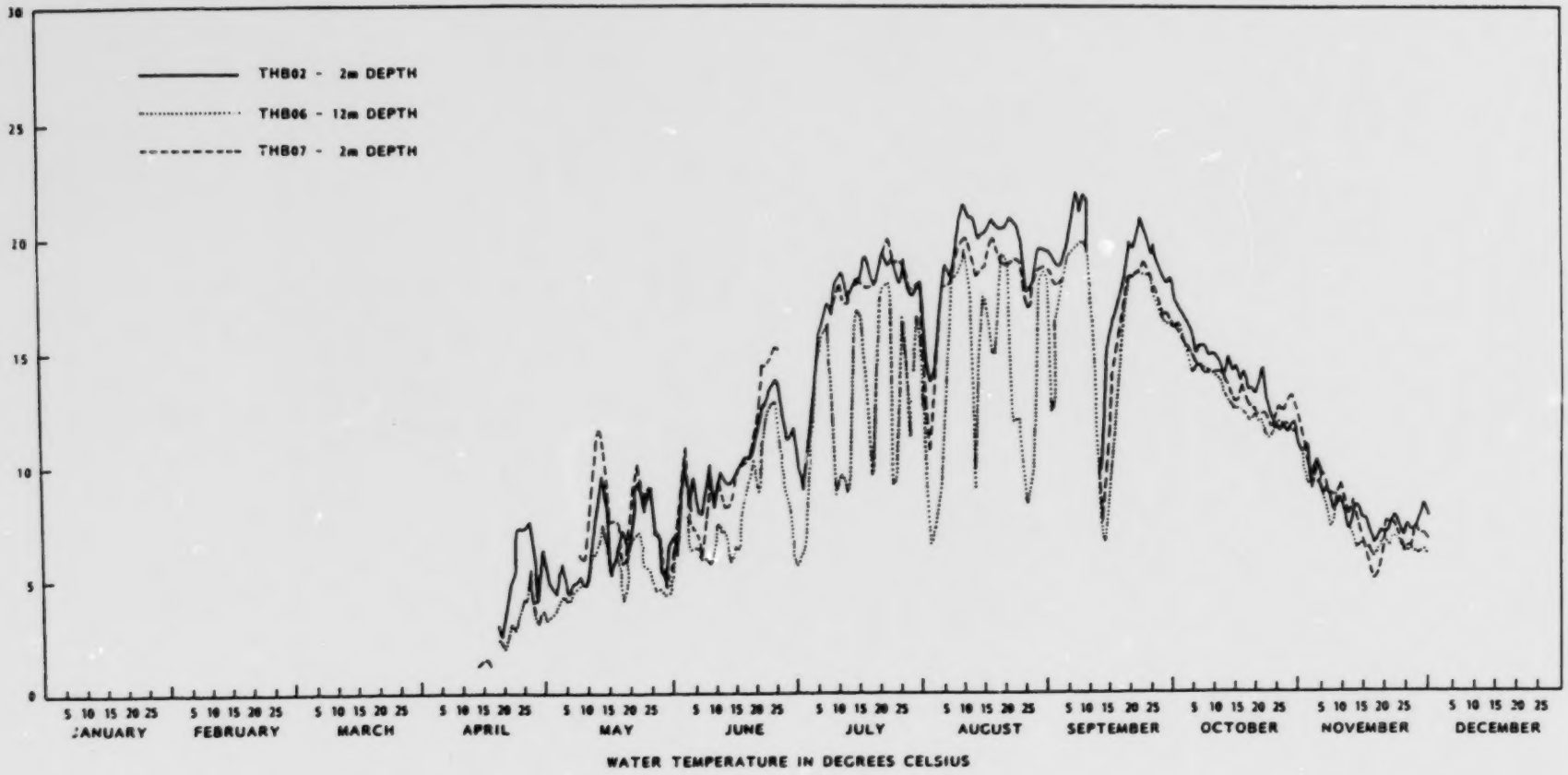

FIGURE 3.1

DAILY MEAN WATER TEMPERATURE AT THREE LOCATIONS
BRUCE G.S. "B", 1985

water passing through the Condenser Cooling System would be heated to temperatures above the ambient surface temperature. This is consistent with the records of thermograph (TH-B06-12), which indicate that at the 12 m depth offshore from the discharge, temperatures increased to 15-18° C from July through September, 1985 (Figure 3.1).

However, temperatures at the 12 m depth were highly variable throughout the period of thermal stratification and regular depressions of temperature to less than 12° C were also observed (Figure 3.1). These fluctuations were caused by episodes of upwelling (the displacement of surface water by cooler water from greater depths,which generally coincided with currents towards the west) or downwelling (the reverse of upwelling, which was associated with currents towards the east) (OHDDD Report No. 86180). In 1985, three significant upwelling and downwelling episodes were evident, where nearsurface (2 m) water temperatures decreased 5° C or more within 2-3 days (Figure 3.1). The frequency of significant upwelling and downwelling episodes was within the range observed in previous years at Bruce "B" (OHRD Report No. 82-107-K; OHRD Report No. 83-182-K; OHRD Report No. 83-451-K; OHDDD Report No. No 86180). Surface waters began to cool in mid-September, with temperatures returning to isothermal conditions by the end of October and then decreasing to 5 °C or less from mid-November on.

Temperature data collected in association with gill netting are contained in Appendix 1. Hourly readings of current direction and velocity at a current meter at 8 m depth, just south of the Bruce "B" discharge (CMB-19-8) during the periods of gill netting are presented in Appendix 2.

3.2.1 Water Chemistry

Table 3.1 summarizes the water quality parameters averaged over all sampling dates for the Bruce "B" intake (surface and 10 m samples) and discharge (surface), while the results averaged for all locations by date and year are presented in Table 3.2. Results of individual samples are contained in Appendix 2.

The values of most parameters were relatively constant, with little variation among locations or sampling dates (Tables 3.1 and 3.2). In general, values obtained in 1985 were also within the range observed in earlier preoperational and commissioning surveys. The increase in non-filterable residues was largely due to high values in August samples, which may have resulted from storms or upwelling in early August, 1985 (Figure 3.1). In 1985, calcium concentrations ranged from 20 to 34.4 mg/L, while calculated water hardness values ranged from 78 to 114 Mg/L as $CaCO_3$. (Water hardness was not measured independently but was calculated from the measured calcium and magnesium concentrations.) This range of values was much greater than in previous years, where reported calcium concentrations ranged from 25-28 mg/L. However, this variation in calcium concentrations was not accompanied by corresponding variations in alkalinity or conductivity. Accordingly, the 1985 calcium and hardness values may be in

TABLE 3.1

SUMMARY OF WATER QUALITY ANALYSIS
BRUCE "B" NGS - 1985
(Mean of 3 Sampling Dates - Raw Data in Appendix 3)

Parameter	Discharge 3 m Contour (Surface)	Intake 12 m Contour (Surface)	Intake 12 m Contour (Bottom)
pH	7.8	7.9	8.0
Colour	None	None	None
Conductivity (ms/m)	20.2	20.4	20.5
Turbidity (NTU)	0.47	0.49	0.66
Alkalinity ($mgCaCo_3/L$)	77	78	77
Non-Filtrable Residues (mg/L)			
105°C (Volatile)	119	119	131
550°C (Non-Volatile)	99	94	108
Filtrable Residues (mg/L)			
105°C (Volatile)	<2	<2	<2
550°C (Non-Volatile)	<2	<2	<2
Total Phosphorus (µg/L)	7.0	7.7	8.7
Soluble Phosphorus (µg/L)	5.0*	6.0*	5.0*
Orthophosphate (µg/L)	<5.0**	<5.0**	<5.0**
Total Silica (mg/L)	1.27	1.28	1.39
Soluble Silica (mg/L)	1.02	1.07	1.12
Total Kjeldahl Nitrogen (mgN/L)	0.32	0.20	0.26
Nitrite Nitrogen (mgN/L)	<0.003	<0.003	<0.003
Nitrate Nitrogen (mgN/L)	0.35	0.35	0.35
Ammonia (mgNH/L)	<0.008	0.009	0.010
Calcium (mg/L)	26.7	28.1	35.8
Aluminum (mg/L)	<1.0	<1.0	<1.0
Potassium (mg/L)	0.83	0.88	0.87
Dissolved Iron (mg/L)	<0.05	<0.05	<0.05
Sodium (mg/L)	3.20	3.17	3.23
Sulphate (mg/L)	17.1	16.7	16.3
Chloride (mg/L)	6.0	7.3	6.0
Magnesium (mg/L)	6.68	6.93	6.94
Hardness ($mgCaCO_3/L$)	94	99	114
Oil and Grease (mg/L)	0.26	0.47	0.11

* N = 1 Date
** N = 2 Dates

TABLE 3.2

WATER CHEMISTRY: DATE & YEARLY MEANS
BRUCE GS "B", 1985

Parameter	June 6	August 8	November 1	Average 1985	Range
pH	7.7	7.9	8.1	7.9	7.6-8.1
Colour	None	None	None	None	None
Conductivity (ms/m)	20.5	20.4	20.2	20.4	19.5-20.5
Turbidity (NTU)	1.0	0.34	0.28	0.54	0.18-1.3
Alkalinity ($mgCaCo_3/L$)	78	78	76.4	77.5	75.1-78.5
Non-Filtrable Residues (mg/L)					
105°C (Volatile)	118	139	112	123	110-158
550°C (Non-Volatile)	84	128	89	100	75-145
Filtrable Residues (mg/L)					
105°C (Volatile)	<2	<2	<2	<2	-
550°C (Non-Volatile)	<2	<2	<2	<2	-
Total Phosphorus (µg/L)	7.3	6.3	9.6	7.8	6-13
Soluble Phosphorus (µg/L)	5.	-	-	-	-
Orthophosphate (µg/L)	<5.	-	<5.	<5.	-
Total Silica (mg/L)	1.88	0.67	1.4	1.32	0.59-1.98
Soluble Silica (mg/L)	1.34	0.52	1.3	1.05	0.59-1.43
Total Kjeldahl Nitrogen (mgN/L)	0.31	0.29	0.18	0.26	0.17-0.44
Nitrite Nitrogen (mgN/L)	<0.003	<0.003	<0.003	<0.003	-
Nitrate Nitrogen (mgN/L)	0.31	0.30	0.44	0.35	0.30-0.44
Ammonia (mgNH/L)	<0.008	<0.012	<0.008	<0.009	<0.008-0.014
Calcium (mg/L)	21.9	26.0	34.3	27.4	20-34.4
Aluminum (mg/L)	<1.0	<1.0	<1.0	<1.0	-
Potassium (mg/L)	0.75	0.95	0.90	0.87	0.67-0.97
Dissolved Iron (mg/L)	<0.05	<0.05	<0.05	<0.05	-
Sodium (mg/L)	2.81	3.38	3.41	3.20	2.77-3.56
Sulphate (mg/L)	16.7	17.3	16.5	16.8	15.9-17.7
Chloride (mg/L)	6.3	7.4	5.7	6.5	5.6-9.8
Magnesium (mg/L)	6.6	7.0	7.0	6.9	6.3-7.4
Hardness ($mgCaCO_3/L$)	78.3	93.2	114	95.2	71.2-114
Oil and Grease (mg/L)	0.67	<0.1	0.77	0.5	<0.1-1.2

(C24B)

error due to sample contamination or measurement error. This was the first year oil and grease in water samples were measured and comparative data for the site were not available.

3.2.2 Sediment Trap- Sediment Chemistry

The elemental composition of samples collected in sediment traps are summarized in Table 3.3, with compete results listed by sample in Appendix 4. As discussed earlier, AAA analysis may provide an estimate of the amount of the element which is 'available' and may be of greater environmental significance than 'total' element concentrations given by NAA.

Calcium and magnesium were the principal components of sedimented material, and together comprised approximately 15% of the sediment at all locations and for both collection periods. The importance of calcium and magnesium corresponds with the predominance of limestone bedrock in the watershed of the study area (OHRD Report No. 83-182-K). Aluminum and iron were also significant constituents, with each comprising more than 1% of the sedimented material. In general, the elemental composition of the sedimented matter was similar among collection sites. Concentrations of heavy metals were consistently low and similar to values reported for sediment trap samples in 1979 (OHRD Report No. 83-182-K). Although the composition of the sedimented materials was generally similar among locations, differences between collection intervals were apparent. The concentrations of iron, sulphur, titanium, zinc, chromium, copper and nickel in sedimented materials collected in the June-August interval were substantially higher (often more than double) than the concentrations of these elements in sediments collected from August-November. Conversely, sodium concentrations in samples collected from June-August were much lower than sodium concentrations in August-November samples. In addition, approximately 50% of the aluminum in sediments collected in the June-August collection period was extracted by the digestion procedure, while less than 20% of the aluminum was extracted from sediments collected in the August-November interval.

3.3.1 Adult and Juvenile Fish

The total catch using gill nets and beach seines is listed by species in Table 3.4. Separate summaries of fish caught in 3.8-12.7 cm gill nets, 2.5 cm gill nets and beach seines are presented in Tables 3.5, 3.6 and 3.7, respectively. Catches in 2.5 cm gill nets were separated from catches with larger meshes to facilitate comparisons with previous sampling years as these larger meshes have been used consistently in previous surveys at BNPD. For the major species, the total catch in 3.8-12.7 cm gill nets from May to November and catch per unit effort (CUE) of each transect are summarized in Table 3.8. Complete catch records for 3.8-12.7 cm gill nets, 2.5 cm gill nets and beach seines are given in Appendices 5, 6, and 7, respectively.

TABLE 3.3

AVERAGE ELEMENTAL COMPOSITION OF SAMPLES COLLECTED IN SEDIMENTATION TUBES (7 m DEPTH), AT INDICATED SITES DURING THE BRUCE "B" NGS, 1985 COMMISSIONING SURVEY
(MEAN ± SE, N = 4)

ELEMENTS		METHOD OF ANALYSIS		COLLECTION PERIOD					
				JUNE 20 - AUGUST 28			AUGUST 29 - NOVEMBER 11		
		AAA	NAA	DOUGLAS POINT	BRUCE "B" DISCHARGE	GUNN POINT	GUNN POINT	BRUCE "B" DISCHARGE	
Calcium	g/kg	x		118.25 ± 2.217	122.00 ± 4.761	107.75 ± 2.63	110.00 ± 0.00	119.75 ± 0.50	
Calcium	g/kg		x	111.50 ± 2.380	120.50 ± 4.435	103.75 ± 6.702	137.00 ± 48.69	121.00 ± 2.00	
Magnesium	g/kg		x	46.50 ± 5.447	45.50 ± 2.887	39.25 ± 4.646	46.20 ± 16.07	42.25 ± 1.50	
Iron	g/kg	x		20.975 ± 1.158	16.275 ± 1.178	30.175 ± 4.40	10.60 ± 0.424	11.10 ± 0.462	
Iron	g/kg		x	22.425 ± 1.454	16.15 ± 2.468	24.00 ± 3.367	12.90 ± 0.931	15.375 ± 0.45	
Aluminum	g/kg	x		12.85 ± 1.079	11.475 ± 0.842	16.625 ± 0.854	6.375 ± 0.144	6.975 ± 0.206	
Aluminum	g/kg		x	30.35 ± 0.473	27.25 ± 0.926	32.25 ± 1.708	28.30 ± 0.577	25.825 ± 0.25	
Sodium	g/kg		x	4.525 ± 0.411	5.10 ± 0.337	5.075 ± 0.737	10.325 ± 1.135	8.25 ± 0.957	
Sulphur	g/kg	x		2.125 ± 0.096	1.975 ± 0.15	1.975 ± 0.34	0.80 ± 0.271	0.975 ± 0.096	
Titanium	g/kg	x		0.605 ± 0.03	0.67 ± 0.063	0.72 ± 0.035	0.37 ± 0.0	0.47 ± 0.035	
Titanium	g/kg		x	1.775 ± 0.15	1.475 ± 0.126	1.69 ± 0.02	1.39 ± 0.615	1.125 ± 0.05	
Manganese	mg/kg	x		320.00 ± 17.32	335.00 ± 17.32	342.50 ± 11.902	300.00 ± 30.00	287.50 ± 2.887	
Manganese	mg/kg		x	306.5 ± 12.396	301.00 ± 8.406	322.50 ± 17.078	288.75 ± 44.417	288.75 ± 2.50	
Strontium	mg/kg	x		243.75 ± 4.787	342.50 ± 11.902	199.25 ± 5.377	200.00 ± 0.00	292.50 ± 191.68	
Zinc	mg/kg	x		75.75 ± 16.256	58.00 ± 4.243	68.75 ± 3.403	28.75 ± 5.136	38.25 ± 5.439	
Chromium	mg/kg	x		63.75 ± 6.292	41.25 ± 2.50	108.75 ± 24.958	38.75 ± 4.787	37.50 ± 2.887	
Chromium	mg/kg		x	86.50 ± 11.902	55.50 ± 9.983	122.50 ± 27.875	47.75 ± 6.021	50.00 ± 4.899	
Rubidium	mg/kg		x	66.00 ± 4.546	50.75 ± 6.185	59.5 ± 3.786	44.00 ± 6.481	45.25 ± 4.272	
Cesium	mg/kg	x		<50.00 ± -	<50.00 ± -	<50.00 ± -	<50.00 ± -	<50.00 ± -	
Cesium	mg/kg		x	2.45 ± 0.129	1.90 ± 0.245	2.375 ± 0.403	1.075 ± 0.05	1.15 ± 0.058	
Barium	mg/kg	x		<50.00 ± -	<50.00 ± -	<50.00 ± -	<50.00 ± -	<50.00 ± -	
Barium	mg/kg		x	309.00 ± 10.52	293.75 ± 52.817	282.50 ± 35.94	337.50 ± 28.723	327.50 ± 22.174	
Bromine	mg/kg		x	46.50 ± 7.188	42.00 ± 5.099	35.25 ± 8.057	13.75 ± 0.957	21.5 ± 3.00	
Vanadium	mg/kg	x		<30.00 ± -	<30.00 ± -	<30.00 ± -	<30.00 ± -	<30.00 ± -	
Vanadium	mg/kg		x	43.25 ± 0.957	36.00 ± 2.449	46.00 ± 2.309	38.00 ± 28.012	25.00 ± 0.816	
Copper	mg/kg	x		25.75 ± 2.062	19.25 ± 0.957	27.25 ± 2.062	10.625 ± 0.75	12.75 ± 0.5	
Nickel	mg/kg	x		23.25 ± 1.50	16.50 ± 1.00	28.00 ± 2.828	9.00 ± 0.816	11.00 ± 0.816	
Lanthanum	mg/kg		x	19.00 ± 1.155	16.50 ± 1.291	17.00 ± 4.546	11.25 ± 0.50	12.50 ± 0.577	
Lead	mg/kg	x		12.25 ± 2.877	15.00 ± 0.00	18.75 ± 2.5	<10.00 ± -	<10.00 ± -	
Scandium	mg/kg		x	6.5475 ± 0.309	5.70 ± 0.523	6.05 ± 0.759	3.925 ± 0.320	4.725 ± 0.096	
Cobalt	mg/kg	x		5.25 ± 0.957	<4.00 ± 0.00	6.00 ± 0.00	<4.00 ± -	<4.00 ± -	
Cobalt	mg/kg		x	8.325 ± 0.377	7.025 ± 0.608	8.125 ± 0.854	4.975 ± 0.35	5.75 ± 0.208	
Thorium	mg/kg		x	4.50 ± 0.956	5.15 ± 1.737	4.475 ± 0.538	2.475 ± 0.25	3.025 ± 0.171	
Arsenic	mg/kg	x		3.68 ± 0.00	3.42 ± 0.06	3.69 ± 0.167	1.9825 ± 0.193	2.3275 ± 0.055	
Arsenic	mg/kg		x	4.267 ± 1.484	4.5 ± 1.137	3.90 ± 0.787	2.50 ± 0.50	1.80* ±	
Samarium	mg/kg		x	2.80 ± 0.356	2.475 ± 0.320	2.425 ± 0.727	1.625 ± 0.206	1.95 ± 0.173	
Beryllium	mg/kg		x	<2.00 ± -	<2.00 ± -	<2.00 ± -	<2.00 ± -	<2.00 ± -	
Cadmium	mg/kg	x		<2.00 ± -	<2.00 ± -	<2.00 ± -	<2.00 ± -	<2.00 ± -	
Ytterbium	mg/kg		x	1.30 ± 0.141	1.12 ± 0.213	1.035 ± 0.13	0.7675 ± 0.377	0.5825 ± 0.353	
Antimony	ug/kg		x	837.50 ± 100.124	642.50 ± 129.968	1625.00 ± 434.933	397.50 ± 115.289	470.00 ± 89.069	
Selenium	ug/kg	x		737.50 ± 47.871	662.50 ± 25.00	587.50 ± 110.867	300.00 ± 70.711	362.50 ± 25.00	
Selenium	ug/kg		x	1300.00 ± 270.801	1325.00 ± 427.20	1105.00 ± 173.108	637.50 ± 174.236	722.50 ± 314.046	
Europium	ug/kg		x	657.50 ± 23.629	565.00 ± 53.299	575.00 ± 54.467	457.50 ± 49.244	532.50 ± 27.538	
Mercury	ug/kg	x		610.00 ± 404.557	855.00 ± 310.966	615.00 ± 378.902	560.00 ± 317.91	272.50 ± 320.143	
Hafnium	ug/kg		x	450.00 ± 25.82	455.00 ± 26.458	400.00 ± 56.568	302.50 ± 32.016	410.00 ± 39.158	
Tanatalum	ug/kg		x	437.50 ± 49.244	347.50 ± 41.13	430.00 ± 107.083	237.50 ± 9.574	315.00 ± 41.231	
Terbium	ug/kg		x	410.00 ± 27.08	355.00 ± 47.258	367.50 ± 49.917	225.00 ± 17.321	275.0 ± 10.00	
Lutetium	ug/kg		x	242.50 ± 22.174	282.50 ± 134.753	207.50 ± 32.016	147.50 ± 9.574	197.5 ± 12.583	

* - Single Value
AAA - Atomic Absorption Analysis
NAA - Neutron Activation Analysis

TABLE 3-4

COMPOSITION OF FISH CATCH IN ALL GEAR TYPES
BRUCE GS "B", 1985

Species		1985		1979-1981
Common Name and Family	Scientific Name	No	%	%
Lamprey (unid.) (Petromyzontidae)		1	<0.1	-
Lake Sturgeon (Acipenseridae)	*Acipenser fulvescens*			<0.1
Longnose Gar (Lepisostaidae)	*Lepisosteus osseus*	1	<0.1	<0.1
Alewife (Clupeidae)	*Alosa pseudoharengus*	7,102	43.2	26.3 - 62.6
Gizzard Shad	*Dorosoma cepedianum*	328	2.0	0.8 - 5.0
Pink Salmon (Salmonidae)	*Oncorhynchus gorbuscha*			<0.1
Coho Salmon	*Oncorhynchus kisutch*	19	0.1	<0.1
Chinook Salmon	*Oncorhynchus tshawytscha*	4	<0.1	<0.1
Cisco	*Coregonus artedii*	2	<0.1	<0.1
Lake Whitefish	*Coregonus clupeaformis*	2	<0.1	<0.1
Round Whitefish	*Prosopium cylindraceum*	19	1.2	0.8 - 2.1
Rainbow Trout	*Salmo gairdneri*	12	<0.1	<0.1 - 0.1
Brown Trout	*Salmo trutta*	10	<0.1	<0.1
Lake Trout	*Salvelinus namaycush*	1	<0.1	<0.1
Splake	*S. namaycush* x *S. alpinus*			<0.1
Rainbow Smelt (Osmeridae)	*Osmerus mordax*	296	1.8	0.4 - 6.7
Northern Pike (Esocidae)	*Esox lucius*			<0.1
Redbelly Dace (Cyprinidae)	*Chrosomus eos*			<0.1
Longnose Dace	*Rhinichthys cataractae*	297	1.8	0.2 - 0.8
Fathead Minnow	*Pimephales promelas*			-
Lake Chub	*Couesius plumbeus*	319	1.9	3.4 - 7.1
Creek Chub	*Semotilus atromaculatus*			<0.1
Carp	*Cyprinus carpio*	36	0.2	<0.1
Golden Shiner	*Notemigonus crysoleucas*			<0.1
Emerald Shiner	*Notropis atherinoides*	46	0.3	0.2 - 0.5
Common Shiner	*Notropis cornutus*			<0.1
Rosyface Shiner	*Notropis rubellus*	1016	6.2	<0.1
Spottail Shiner	*Notropis hudsonius*			5.0 - 27.9
Mimic Shiner	*Notropis volucellus*			<0.1
Sand Shiner	*Notropis stramineus*			-
Bluntnose Minnow	*Pimephales notatus*			0.1 - 0.2
Cyprinidae (unid.)		39	0.2	<0.1 - 0.4
Longnose Sucker (Catostomidae)	*Catostomus catostomus*	1819	11.1	7.7 - 13.2
White Sucker	*Catostomus commersoni*	834	5.1	5.9 - 9.5
Golden Redhorse	*Moxostoma erythrurum*			0 - 0.2
Shorthead Redhorse	*Moxostoma macrolepidotum*			0 - 0.2
Redhorse (unid.)		28	0.2	0 - 0.2
Brown Bullhead (Ictaluridae)	*Ictalurus nebulosus*	8	<0.1	<0.1
Channel Catfish	*Ictalurus punctatus*	42	0.3	<0.1 - 0.4
Stone Cat	*Noturus flavus*	2	<0.1	<0.1
Burbot (Gadidae)	*Lota lota*	485	3.0	0.3 - 0.8
Brook Stickleback (Gasterosteidae)	*Culaea inconstans*			<0.1
Threespine Stickleback	*Gasterosteus aculeatus*			<0.1
Ninespine Stickleback	*Pungitius pungitius*			<0.1
Trout-Perch (Percopsidae)	*Percopsis omiscomaycus*	2	<0.1	<0.1 - 0.3
White Bass (Percichthyidae)	*Morone chrysops*	5	<0.1	<0.1 - 0.1
White Perch	*Morone americana*	1	<0.1	-
Rock Bass (Centrarchidae)	*Ambloplites rupestris*	5	<0.1	<0.1
Smallmouth Bass	*Micropterus dolomieui*	13	<0.1	0.1 - 0.2
Pumpkinseed	*Lepomis gibbosus*			<0.1
Black Crappie	*Pomoxis nigromaculatus*			<0.1
Fantail Darter (Percidae)	*Etheostoma flabellare*	3	<0.1	<0.1
Iowa Darter	*Etheostoma exile*	1	<0.1	-
Johnny Darter	*Etheostoma nigrum*	19	0.1	<0.1
Yellow Perch	*Perca flavescens*	3,228	19.6	3.5 - 11.7
Logperch	*Percina caprodes*	2	<0.1	<0.1
Walleye	*Stizostedion vitreum*	160	1.0	0.1 - 0.5
Sauger	*Stizostedion canadense*	1	<0.1	-
Freshwater Drum (Sciaenidae)	*Aplodinotus grunniens*	43	0.3	<0.1
Mottled Sculpin (Cottidae)	*Cottus bairdi*	1	<0.1	<0.1
Slimy Sculpin	*Cottus cognatus*	2	<0.1	<0.1
TOTAL CATCH		16,419		14 013 - 25 360 (mean)
No of Species (excluding unid.)		39		35 - 48 (mean)

(C57)
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TABLE 3.5
FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985
3.8cm - 12.7cm MESH NETS
ALL LOCATIONS

SPECIES	APRIL 12			MAY 28			JUNE 25			JULY 24			AUGUST 27			SEPTEMBER 26			OCTOBER 30			NOVEMBER 26			DECEMBER 10			ALL DATES		
	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH
ALEWIFE	15	100	115	1915	502	2417	1197	442	1639	1041	105	1146	25	720	745	7	5	12	0	0	0	0	1	1	0	3	3	4200	1878	6078
GIZZARD SHAD	132	18	150	0	0	0	0	0	0	6	0	6	5	5	10	22	18	40	96	7	103	7	0	7	11	0	11	279	48	327
ROUND WHITEFISH	19	4	23	4	7	11	1	7	8	0	3	3	1	1	2	17	21	38	43	7	50	26	7	33	21	2	23	132	59	191
LAKE WHITEFISH	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	2
LAKE HERRING	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2	0	2
LAKE TROUT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1
RAINBOW TROUT	5	0	5	0	0	0	0	1	1	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	9	3	12
BROWN TROUT	5	1	6	1	0	1	0	0	0	1	0	1	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	9	1	10
COHO SALMON	7	5	12	0	0	0	0	0	0	1	3	4	0	1	1	0	1	1	0	0	0	0	0	0	1	0	1	9	10	19
CHINOOK SALMON	1	1	2	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4
SMELT	1	6	7	0	0	0	0	4	4	0	25	25	3	1	4	0	1	1	0	0	0	1	0	1	2	1	3	7	38	45
CARP	3	0	3	0	0	0	9	0	9	4	0	4	4	2	6	0	6	6	5	2	7	1	0	1	0	0	0	26	10	36
SPOTTAIL SHINER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	5	0	0	0	0	0	0	4	1	5
LAKE CHUB	23	3	26	9	0	9	3	0	3	14	4	18	0	4	4	0	12	12	1	7	8	1	2	3	4	3	7	55	35	90
LONGNOSE SUCKER	115	27	142	88	59	147	136	97	233	235	42	277	122	225	347	13	132	145	134	186	320	32	125	157	9	32	41	884	925	1809
WHITE SUCKER	25	2	27	13	0	13	127	65	192	100	13	113	51	15	66	48	137	185	36	50	86	41	66	107	19	21	40	460	369	829
REDHORSE SUCKER	1	0	1	0	0	0	4	0	4	7	1	8	5	2	7	2	0	2	4	1	5	1	0	1	0	0	0	24	4	28
CHANNEL CATFISH	0	1	1	1	1	2	10	3	13	1	0	1	1	10	11	2	3	5	6	2	8	1	0	1	0	0	0	22	20	42
BROWN BULLHEAD	0	0	0	0	0	0	0	1	1	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	8	8
STONECAT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2	2

TABLE 3.5
FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985
3.8cm - 12.7cm MESH NETS
ALL LOCATIONS

SPECIES	APRIL 12			MAY 28			JUNE 25			JULY 24			AUGUST 27			SEPTEMBER 26			OCTOBER 30			NOVEMBER 26			DECEMBER 10			ALL DATES		
	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH
BURBOT	30	98	128	68	75	143	5	33	38	1	29	30	0	4	4	0	2	2	4	10	14	19	55	74	15	36	51	142	342	484
TROUT-PERCH	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
WHITE PERCH	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	2	0	1	1	0	1	1	0	0	0	2	3	5
WHITE BASS	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	5	6
SMALLMOUTH BASS	0	0	0	0	0	0	0	0	0	3	0	3	0	1	1	0	3	3	3	2	5	0	1	1	0	0	0	6	7	13
ROCK BASS	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	0	3	0	0	0	0	0	0	0	0	0	3	1	4
YELLOW PERCH	1	4	5	1	4	5	113	378	491	244	33	277	650	364	1014	21	1270	1291	16	39	55	0	4	4	0	5	5	1046	2101	3147
WALLEYE	2	0	2	0	0	0	2	0	2	12	0	12	7	4	11	14	22	36	45	11	56	29	7	36	5	0	5	116	44	160
SAUGER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1
FRESHWATER DRUM	0	0	0	0	0	0	4	0	4	2	0	2	2	3	5	10	4	14	9	0	9	7	2	9	0	0	0	34	9	43
ALL SPECIES	386	275	661	2100	649	2749	1611	1031	2642	1673	262	1935	877	1370	2247	162	1640	1802	407	326	733	166	271	437	95	103	198	7477	5927	13404

TABLE 3.6
FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985
2.5cm MESH NETS
ALL LOCATIONS

SPECIES	APRIL 12			MAY 28			JUNE 25			JULY 24			AUGUST 27			SEPTEMBER 26			OCTOBER 30			NOVEMBER 26			DECEMBER 10			ALL DATES		
	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH	3m	12m	BOTH
LONGNOSE GAR			0			0			0			0			0		1	1			0			0			0			
ALEWIFE			0	62	9	71	97	310	407	463	43	506	1	10	11	18	1	19			0			0			0	641	373	1014
SMELT	9	4	13	11	4	15	26	45	71	1	51	52	39	25	64		6	6	1		1	3	7	10	6	1	7	96	143	239
SPOTTAIL SHINER	3		3	51	2	53	359	48	407		122	122	58	24	82	3	36	39	11	8	19			0			0	485	240	725
LAKE CHUB	6		6	24	2	26	70	2	72	88	13	101			0		1	1	4	4	8			0	2		2	194	22	216
LONGNOSE SUCKER			0			0			0	2		2		1	1		2	2		3	3			0			0	2	6	8
WHITE SUCKER			0			0			0	1		1			0			0			0			0			0	1	0	1
BURBOT			0			0		1	1			0			0			0			0			0			0	0	1	1
TROUT-PERCH			0			0		1	1			0			0			0			0			0			0	0	1	1
YELLOW PERCH			0			0	9	53	62	8		8	1	5	6		2	2			0		1	1			0	18	61	79
LOGPERCH			0			0			0	1		1			0		1	1			0			0			0	1	1	2
ALL SPECIES	18	4	22	148	17	165	561	460	1021	564	229	793	99	65	164	21	50	71	16	15	31	3	8	11	8	1	9	1438	848	2286

TABLE 3.7
FISH CATCH IN SEINE AT BRUCE GS "B"
MAY - JULY, 1985

SPECIES	LOC	BRUCE "A" INTAKE				DOUGLAS POINT				BRUCE "B" INTAKE				INVERHURON BAY				HOLMES BAY				GUNN POINT				ALL SITES			
		MAY	JUNE	JULY	ALL	MAY	JUNE	JULY	ALL	MAY	JUNE	JULY	ALL	MAY	JUNE	JULY	ALL	MAY	JUNE	JULY	ALL	MAY	JUNE	JULY	ALL	MAY	JUNE	JULY	ALL
	DATE	29	26	23	DATES	29	26	23	DATES	29	26	23	DATES	29	26	23	DATES	29	26	23	DATES	29	26	23	DATES	29	26	23	DATES
LAMPREY		0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
ALEWIFE		0	0	0	0	0	0	0	0	0	1	0	1	1	4	0	5	0	1	0	1	0	2	0	2	1	8	0	9
RAINBOW SMELT		0	0	0	0	0	0	0	0	2	1	0	3	3	2	0	5	0	0	1	1	1	1	0	2	6	4	1	11
LONGNOSE DACE		1	0	4	5	0	6	2	8	38	35	25	98	2	1	4	7	14	54	30	98	30	16	35	81	85	112	100	297
EMERALD SHINER		1	0	0	1	0	0	0	0	0	1	0	1	8	1	5	14	12	1	0	13	17	0	0	17	38	3	5	46
SPOTTAIL SHINER		0	4	3	7	4	2	0	6	4	69	13	86	25	13	15	53	0	21	1	22	56	50	5	111	89	159	37	285
LAKE CHUB		0	0	0	0	0	0	0	0	10	0	1	11	0	0	0	0	0	0	0	0	2	0	0	2	12	0	1	13
JUVENILE CYPRINID		0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2	31	33	0	4	0	4	0	6	33	39
LONGNOSE SUCKER		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1
WHITE SUCKER		0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	1	1	0	0	0	0	0	0	3	3
YELLOW PERCH		0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
FANTAIL DARTER		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	3	0	0	0	0	2	1	0	3
JOHNNY DARTER		0	0	0	0	4	1	0	5	1	2	0	3	5	1	0	6	1	3	1	5	0	0	0	0	11	7	1	19
IOWA DARTER		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1
SLIMY SCULPIN		0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2	2	2	0	2	4
MOTTLED SCULPIN		0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	2	0	0	2
ROCK BASS		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1
TOTAL		2	4	7	13	8	9	2	19	57	110	43	210	45	22	25	92	29	84	65	178	108	74	42	224	230	231	179	736

In total, more than 16,000 fish of 39 species were caught. One species, the Iowa darter, was not reported in preoperational or commissioning surveys but the species is widely distributed throughout the Great Lakes drainage area, including Lake Huron (Scott and Crossman 1973). The number of species recorded was reduced somewhat from previous years, for example, 45 species were collected in 1983 (OHRD Report No. 86-166-K).

As in previous years alewife predominated among fish species, with over 6,000 fish collected comprising approximately 43% of the total catch (Table 3-4). The increase in yellow perch noted in 1983 (OHRD Report No. 86-166-K) continued in 1985, with the 3,147 yellow perch caught constituting approximately 20% of the total catch, as compared to 7.5% in 1983 and 3.5-11.7% from 1979-81 (OHRD Report No. 83-166-K). Other species which comprised more than 5% of the total catch included: longnose sucker (1,819 fish; 11% of total catch), spottail shiner (1016 fish; 6% of total catch) and white sucker (834 fish; 5% of total catch). In addition, gizzard shad, round whitefish, rainbow smelt, longnose dace, lake chub, burbot and walleye each comprised from 1-5% of the total catch.

The temporal distribution of the catch in 3.5-12.7 cm gill nets differed considerably between species (Table 3.5). Greater than 50% of burbot were collected in the spring (April-May). The majority of alewife were caught in the late spring and early summer, with 85% of the alewife collected in the months of May, June and July. Catches of yellow perch increased throughout the summer, and peaked in the months of August and September, when 73% of all perch were caught. Most walleye and round whitefish were caught in the fall, with over 50% of walleye collected in October and November, and approximately 75% of round whitefish caught from September to November. Longnose and white sucker were caught in relatively constant numbers throughout the year.

Differences in the depth distribution were also apparent among species (Table 3.5). From June through July, approximately 80% of alewife were caught in shallow (3 m) nets, however, a shift to deeper water was evident in August, when more than 95% of the alewife were caught in deep (12 m) nets. These seasonal changes in the distribution of alewife were consistent with the patterns observed in previous years. The majority of burbot were caught in deep (12 m) nets, which was also in agreement with earlier studies. In 1985, more than 65% of yellow perch were caught in the deep (12 m) nets, a pattern which was consistent with observations in 1983. However, in preoperational surveys (1979-1981) and in 1984, approximately equal numbers of perch were caught in shallow (3 m) and deep (12 m) nets.

The observed patterns of fish distribution reflect the life histories of the various fish species and are generally consistent with previous surveys at BNPD. Alewife concentrate and spawn in the nearshore zone in the late spring and early summer (Scott and Crossman 1973) as seen in the elevated catches of alewife in the shallow (3 m) nets from May through July. After spawning, alewife move to deeper waters as was observed in the increased

catch of alewife in deep (12 m) nets in August. The autumn increase in round whitefish also corresponds to the autumn spawning of this species (Scott and Crossman 1973; OHRD Report No. 83-451-K; OHRD Report No. 86-166-K). Peak catches do not always correspond to spawning activities, however, as highest catches of perch and walleye were in the fall, although both species spawn in the spring (Scott and Crossman 1973). In this case, it appears that perch and walleye generally spawn outside the study area, then move into the area later in the year.

The 2.5 cm mesh gill nets selected small forage fish, with alewife, smelt, spottail shiner and lake chub, each comprising more than 10% of the total catch (Table 3.6). These fish were concentrated in shallow waters, as more than 80% of the cyprinids and more than 60% of the alewife were caught in the shallow (3 m) nets.

Minnows also predominated in the beach seine catches (Table 3.7), with longnose dace and spottail shiner each contributing approximately 40% of the total beach seine catch. As a consequence of inclement weather preventing beach seining in August and September, young-of-year alewife were not sampled.

In addition to gill netting and beach seines, the abundance of fish in the Bruce "B" discharge was assessed visually by divers in dives of approximately 1 h on June 5 and August 29. Fish observed on June 5 were: 12 white sucker, 9 alewife, 8 longnose sucker, 6 gizzard shad, 4 yellow perch and 2 carp. Fish observed on August 29 were: 131 smallmouth bass, 94 carp, 68 walleye, 37 yellow perch, 8 freshwater drum, 5 gizzard shad and a rock bass.

Although the mean monthly CUE of some of the major fish species varied as much as four-fold among transects, variation in the geometric mean of the monthly CUE was much less, and marked north-south trends in CUE were not apparent (Table 3.8). For alewife, longnose sucker and yellow perch the highest mean CUE's were at Gunn Point, with the highest CUE's of yellow perch localized in the southern portions of the study area (Gunn Point and Holmes Bay). The distribution of CUE of the major fish species was qualitatively similar to that observed in earlier preoperational and commissioning surveys (OHRD Report No. 83-107-K; OHRD Report No. 83-182-K; OHRD Report No. 86-166-K).

3.3.2 Larval fish distribution and abundance

Ichthyoplankton were collected using the benthic sled and bottom or surface tows with plankton nets. It was hoped that the benthic sled and bottom tows would sample benthic, demersal fish larvae which were not effectively sampled by surface tows which sample pelagic fish larvae. The results of April 1985 benthic sled tows at four locations are summarized in Table 3.9 (data for individual samples in Appendix 8), while the results of subsequent bottom tows off the Bruce "B" intake at 7, 12 and 16 m from May

TABLE 3.8

TOTAL FISH CATCH AND CATCH PER UNIT EFFORT (CUE)* (3.8cm - 12.7cm mesh gill nets)

BRUCE GS "B", MAY - NOVEMBER 1985

		ALEWIFE	GIZZARD SHAD	ROUND WHITEFISH	LONGNOSE SUCKER	WHITE SUCKER	BURBOT	YELLOW PERCH	WALLEYE
BRUCE	total catch	1270	100	62	97	50	23	272	22
GS "A"	mean monthly CUE	46.7	3.5	2.1	3.8	1.7	0.7	9.9	0.7
INTAKE	log mean monthly CUE	11.2	3.0	2.6	3.2	2.1	1.5	4.8	1.6
	max monthly CUE	133.3	11.0	6.5	14.3	5.6	2.3	27.7	2.0
	min monthly CUE	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0
DOUGLAS	total catch	915	107	86	236	101	31	540	31
POINT	mean monthly CUE	32.7	3.7	2.9	7.8	3.1	0.9	16.7	1.0
	log mean monthly CUE	9.6	2.8	2.9	5.8	3.5	1.6	7.7	1.7
	max monthly CUE	97.0	11.3	9.5	17.8	6.5	3.0	72.0	2.5
	min monthly CUE	0.0	0.0	0.0	0.0	0.5	0.0	0.3	0.0
BRUCE	total catch	739	102	75	153	89	67	423	39
GS "B"	mean monthly CUE	26.4	3.6	2.6	4.9	2.8	2.2	13.7	1.2
DISCHARGE	log mean monthly CUE	9.0	2.9	2.8	4.4	3.4	2.0	5.8	2.1
	max monthly CUE	51.5	11.0	8.0	10.5	4.2	11.0	43.5	2.8
	min monthly CUE	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
BRUCE	total catch	985	83	53	157	65	34	214	35
GS "B"	mean monthly CUE	35.3	3.2	2.0	5.5	2.6	1.1	8.2	1.4
INTAKE	log mean monthly CUE	10.4	3.0	2.4	4.3	3.2	1.7	4.5	1.9
	max monthly CUE	103.5	8.0	7.0	16.8	6.5	5.5	34.0	4.5
	min monthly CUE	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0
HOLMES	total catch	617	154	109	137	118	27	661	10
BAY	mean monthly CUE	22.0	5.5	3.7	4.6	3.6	0.9	22.0	0.3
	log mean monthly CUE	8.6	3.3	3.1	4.0	3.8	1.6	8.9	1.3
	max monthly CUE	51.8	14.3	11.0	9.8	9.4	4.0	51.0	1.5
	min monthly CUE	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0
GUNN	total catch	1434	124	54	347	102	61	1027	16
POINT	mean monthly CUE	51.2	4.4	1.9	11.4	3.0	2.0	33.9	0.5
	log mean monthly CUE	13.5	2.5	2.2	7.2	3.3	2.0	12.5	1.4
	max monthly CUE	172.5	22.3	6.0	29.8	8.8	10.0	86.8	1.4
	min monthly CUE	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
ALL	total catch	5960	670	439	1127	525	243	3137	153
TRANSECTS	mean monthly CUE	35.7	4.0	2.5	6.4	2.8	1.3	18.1	0.8
	log mean monthly CUE	10.8	3.1	2.8	5.1	3.4	1.8	8.3	1.7
	max monthly CUE	100.7	11.5	8.0	15.1	6.9	6.0	47.8	2.3
	min monthly CUE	0.0	0.0	0.1	0.1	0.5	0.0	0.1	0.0

* CUE = (number fish caught in monthly sets at location)/(number of days nets set at location)

TABLE 3.9
LARVAL FISH CATCH IN BENTHIC SLED TOWS - APRIL 1985

LOCATION	DATE	DEPTH	SPECIES: SMELT eggs	BURBOT eggs	BURBOT larvae	NORTHERN PIKE	DEEP WATER SCULPIN	total eggs	total larvae	COMBINED TOTAL
BRUCE "B" INTAKE	85/04/12	5m	0	0	0	0	0	0	0	0
		7m	0	0	0	0	0	0	0	0
		both	0	0	0	0	0	0	0	0
	85/04/26	5m	45	0	0	0	0	45	0	45
		7m	17	0	0	0	0	17	0	17
		both	62	0	0	0	0	62	0	62
	ALL DATES		62	0	0	0	0	62	0	62
BRUCE "B" DISCHARGE	85/04/12	5m	0	0	0	0	4	0	4	4
		7m	0	0	0	0	24	0	24	24
		both	0	0	0	0	28	0	28	28
	85/04/24	5m	59	2	1	0	0	61	1	62
		7m	59	12	0	0	1	71	1	72
		both	118	14	1	0	1	132	2	134
	85/04/26	5m	9	0	0	1	0	9	1	10
		7m	220	0	0	0	0	220	0	220
		both	229	0	0	1	0	229	1	230
	ALL DATES		347	14	1	1	29	361	31	392
HOLMES BAY	85/04/12	3m	0	0	0	0	0	0	0	0
		7m	0	0	0	0	1	0	1	1
		both	0	0	0	0	1	0	1	1
	85/04/24	3m	4	0	1	0	0	4	1	5
		7m	26	0	0	0	0	26	0	26
		both	30	0	1	0	0	30	1	31
	85/04/26	3m	9	0	0	0	0	9	0	9
		7m	0	0	0	0	0	0	0	0
		both	9	0	0	0	0	9	0	9
	ALL DATES		39	0	1	0	1	39	2	41
INVERHURON BAY	85/04/12	3m	0	0	0	0	1	0	1	1
		7m	0	1	0	0	0	1	0	1
		both	0	1	0	0	1	1	1	2
ALL SITES	ALL DATES		448	15	2	1	31	463	34	497

TABLE 3.10
LARVAL FISH DENSITIES IN BOTTOM TOWS - BRUCE "B" INTAKE, 1985
(larvae/ 1000 m**3)

DATE / DEPTH	SPECIES											
	ALEWIFE	BUBBOT	SMELT	ROUND WHITEFISH	LAKE WHITEFISH	CISCO	CYPRINID (unid.)	TROUT-PERCH	YELLOW PERCH	DEEP WATER SCULPIN	SLIMY SCULPIN	TOTAL
MAY 22-23, 1985												
7m	0.0	442.9	528.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	971.4
12m	0.0	728.6	357.1	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0	1114.3
16m	0.0	642.9	214.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	857.1
all depths	0.0	604.8	366.7	0.0	0.0	0.0	0.0	0.0	0.0	9.5	0.0	981.0
JUNE 3-4, 1985												
7m	0.0	685.7	257.1	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	957.1
12m	0.0	742.9	385.7	0.0	0.0	0.0	0.0	0.0	0.0	14.3	0.0	1142.9
16m	0.0	471.4	528.6	0.0	0.0	0.0	0.0	0.0	14.3	0.0	0.0	1014.3
all depths	0.0	633.3	390.5	4.8	0.0	0.0	0.0	0.0	4.8	4.8	0.0	1038.1
JUNE 19-20, 1985												
7m	0.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3
12m	0.0	28.6	157.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	185.7
16m	0.0	42.9	214.3	0.0	0.0	14.3	0.0	0.0	0.0	14.3	0.0	285.7
all depths	0.0	28.6	123.8	0.0	0.0	4.8	0.0	0.0	0.0	4.8	0.0	161.9
JULY 2+4, 1985												
7m	0.0	28.6	0.0	0.0	0.0	0.0	0.0	42.9	14.3	0.0	0.0	85.7
12m	0.0	0.0	0.0	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0	14.3
16m	0.0	0.0	0.0	0.0	14.3	0.0	14.3	0.0	0.0	0.0	0.0	28.6
all depths	0.0	9.5	0.0	0.0	4.8	0.0	9.5	14.3	4.8	0.0	0.0	42.9
AUGUST 7-8, 1985												
7m	128.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	128.6
12m	71.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0	14.3	114.3
16m	42.9	0.0	14.3	0.0	0.0	0.0	0.0	0.0	14.3	0.0	0.0	71.4
all depths	81.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	14.3	0.0	4.8	104.8
AVERAGE												
7m	25.7	234.3	157.1	2.9	0.0	0.0	0.0	8.6	2.9	0.0	0.0	431.4
12m	14.3	300.0	180.0	0.0	0.0	0.0	2.9	0.0	5.7	8.6	2.9	514.3
16m	8.6	231.4	194.3	0.0	2.9	2.9	2.9	0.0	5.7	2.9	0.0	451.4

TABLE 3.11
LARVAL FISH DENSITIES - SURFACE LARVAL TOWS AT DESIGNATED LOCATIONS
(larvae/ 1000 m**3)

SPECIES

LOCATION	DATE	ALEWIFE egg	ALEWIFE larvae	ROUND WHITEFISH	SMELT egg	SMELT larvae	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	BURBOT	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
BRUCE "B"																				
INTAKE	MAY 22-23	0	0	0	2.33	1181.14	0	0	0	0	163.4	0	0	0	0	0	0	2.33	1344.54	1346.87
	JUNE 3-4	0	0	0	0	471.52	0	0	0	0	249.77	0	0	0	0	0	0	0	721.29	721.29
	JUNE 19-20	0	0	0	0	2.33	0	0	0	0	0	0	0	0	0	0	18.67	0	21	21
	JULY 2, 4	0	0	0	0	0	0	8.4	0	0	0	0	0	0	28.01	0	2.8	0	39.21	39.21
	AUGUST 7-8	0	536.88	0	0	4.67	0	4.67	0	0	0	28.01	2.33	7	0	0	0	0	583.56	583.56
	SEPTEMBER 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	AVERAGE	0	89.48	0	0.39	276.61	0	2.18	0	0	68.86	4.67	0.39	1.17	4.67	0	3.58	0.39	451.6	451.99
BRUCE "B"																				
FOREBAY	MAY 22-23	0	0	0	69.33	46.23	0	0	0	0	508.4	0	0	0	0	0	0	69.33	554.63	623.96
	JUNE 3-4	0	0	0	23.1	23.1	0	0	0	0	531.5	0	0	0	0	0	0	23.10	554.60	577.80
	JUNE 19-20	0	0	0	0	0	0	0	0	0	23.1	0	0	0	0	0	0	0.00	23.10	7.69
	JULY 2, 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00
	AUGUST 7-8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23.1	0.00	23.10	23.10
	SEPTEMBER 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23.1	0.00	23.10	23.10
	AVERAGE	0	0	0	15.41	11.56	0	0	0	0	177.17	0	0	0	0	0	7.7	15.41	196.42	209.28
BRUCE "B"																				
DISCHARGE	MAY 22-23	0	0	2.33	0	737.63	0	0	0	0	49.02	0	0	0	0	0	0	0	788.98	788.98
	JUNE 3-4	0	0	0	0	100.37	0	0	2.33	0	44.35	0	0	0	0	0	0	0	147.05	147.05
	JUNE 19-20	0	7	0	0	2.33	0	2.33	0	0	2.33	0	4.67	0	0	0	7	0	25.66	25.66
	JULY 2, 4	60.69	18.67	2.33	0	0	0	0	0	0	2.33	0	0	0	7	0	4.67	60.69	35	95.69
	AUGUST 7-8	0	506.54	0	0	0	0	0	0	0	0	7	4.67	53.69	0	0	0	0	571.9	571.9
	SEPTEMBER 4	0	9.34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.34	9.34
	AVERAGE	10.12	90.26	0.78	0	140.06	0	0.39	0.39	0	16.34	1.17	1.56	8.95	1.17	0	1.95	10.12	262.99	273.1

TABLE 3.11
LARVAL FISH DENSITIES - SURFACE LARVAL TOWS AT DESIGNATED LOCATIONS
(larvae/ 1000 m**3)

SPECIES —

LOCATION	DATE	ALEWIFE egg	ALEWIFE larvae	ROUND WHITEFISH	SMELT egg	SMELT larvae	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	BURBOT	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
BRUCE "A" INTAKE	MAY 22-23	0	0	0	0	665.27	0	0	0	0	11.67	0	0	0	0	0	0	0	676.94	676.94
	JUNE 3-4	0	0	0	0	44.35	0	0	0	0	7	0	0	0	0	0	0	0	51.35	51.35
	JUNE 19-20	0	0	0	0	4.67	0	0	0	0	0	0	0	0	0	0	0	0	4.67	4.67
	JULY 2, 4	60.69	114.38	0	0	0	0	81.7	0	0	0	14.01	2.33	0	0	23.34	9.34	84.03	221.76	305.79
	AUGUST 7-8	0	373.48	0	0	0	0	0	0	0	0	39.68	0	39.68	0	0	0	0	452.84	452.84
	SEPTEMBER 4	0	28.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28.01	28.01
	AVERAGE	10.12	85.98	0	0	119.05	0	13.62	0	0	3.11	8.95	0.39	6.61	0	3.89	1.56	14.01	239.26	253.27
DOUGLAS POINT	MAY 22-23	0	0	0	4.67	1260.5	0	0	2.33	0	74.7	?	0	0	0	0	0	4.67	1337.53	1342.2
	JUNE 3-4	0	0	0	0	154.06	0	0	0	0	86.37	0	2.33	0	0	0	0	0	242.76	242.76
	JUNE 19-20	0	0	0	0	0	0	0	0	0	0	0	2.8	0	0	0	0	0	2.33	2.33
	JULY 2, 4	7	72.36	0	0	0	7	4.67	0	0	9.34	0	0	0	9.34	0	14.01	7	116.72	123.72
	AUGUST 7-8	0	760.97	0	0	0	0	0	0	0	0	11.67	0	60.69	0	0	0	0	833.33	833.33
	SEPTEMBER 4	0	9.34	0	0	14.01	0	0	0	0	0	0	0	0	0	0	0	0	23.35	23.35
	AVERAGE	1.17	140.45	0	0.78	238.1	1.17	0.78	0.39	0	28.4	1.95	0.78	10.12	1.56	0	2.34	1.95	426	427.95

TABLE 3.11
LARVAL FISH DENSITIES - SURFACE LARVAL TOWS AT DESIGNATED LOCATIONS
(larvae/ 1000 m**3)

SPECIES

LOCATION	DATE	ALEWIFE egg	ALEWIFE larvae	ROUND WHITEFISH	SMELT egg	SMELT larvae	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	BURBOT	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
SOUTH BOUNDARY POINT	MAY 22-23	0	0	0	0	819.33	0	0	0	0	107.38	0	0	0	0	0	0	0	926.71	926.71
	JUNE 3-4	0	0	0	0	1020.07	0	0	0	0	1148.46	0	0	0	0	0	0	0	2168.53	2168.53
	JUNE 19-20	0	0	0	0	16.81	0	2.8	0	0	0	0	2.8	0	0	0	0	0	18.67	18.67
	JULY 2, 4	184.87	0	0	0	2.8	0	5.6	0	0	0	0	0	0	84.03	0	0	154.06	77.03	231.09
	AUGUST 7-8	0	326.8	0	0	2.33	0	2.33	0	0	0	11.67	0	44.35	0	0	0	0	387.48	387.48
	SEPTEMBER 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	AVERAGE	25.68	54.47	0	0	309.68	0	1.56	0	0	209.31	1.95	0.39	7.39	11.67	0	0	25.68	596.4	622.08
HOLMES BAY	MAY 22-23	0	0	0	2.33	231.09	0	0	9.34	2.33	51.35	0	0	0	0	0	0	2.33	294.11	296.44
	JUNE 3-4	0	0	2.33	0	644.26	0	0	2.33	0	326.8	0	0	0	0	0	0	0	975.72	975.72
	JUNE 19-20	0	0	0	0	2.33	0	4.67	0	0	0	0	0	0	0	0	0	0	7	7
	JULY 2, 4	11.67	2.33	0	0	2.33	0	0	0	0	0	2.33	0	18.67	9.34	0	7	11.67	42	53.67
	AUGUST 7-8	0	1851.07	0	0	0	0	30.35	0	0	0	2.33	0	67.69	0	0	0	0	1951.44	1951.44
	SEPTEMBER 4	0	0	0	0	0	0	4.67	0	0	0	0	0	0	0	0	0	0	4.67	4.67
	AVERAGE	1.95	308.9	0.39	0.39	146.67	0	6.62	1.95	0.39	63.03	0.78	0	14.39	1.56	0	1.17	2.33	545.82	548.16
GUNN POINT	MAY 22-23	0	0	0	7	693.28	0	2.33	0	0	39.68	0	0	0	0	0	0	7	735.29	742.29
	JUNE 3-4	0	0	0	0	506.54	0	0	0	0	142.39	0	0	0	0	0	0	0	648.93	648.93
	JUNE 19-20	0	0	0	11.2	0	0	2.8	0	0	0	0	0	0	0	0	0	9.34	2.33	11.67
	JULY 2, 4	100.84	0	0	0	0	0	5.6	0	0	0	0	196.08	0	0	0	16.81	84.03	182.08	266.11
	AUGUST 7-8	0	121.38	0	0	0	0	2.33	0	0	0	35.01	0	91.04	0	0	0	0	249.76	249.76
	SEPTEMBER 4	0	14.01	0	0	4.67	0	0	0	0	0	0	0	0	0	0	0	0	18.68	18.68
	AVERAGE	14.01	22.57	0	2.72	200.75	0	1.94	0	0	30.34	5.84	27.23	15.17	0	0	2.34	16.73	306.18	322.91

TABLE 3.11
LARVAL FISH DENSITIES - SURFACE LARVAL TOWS AT DESIGNATED LOCATIONS
(larvae/ 1000 m**3)

SPECIES

LOCATION	DATE	ALEWIFE eggs	ALEWIFE larvae	ROUND WHITEFISH	SMELT eggs	SMELT larvae	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	BURBOT	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
INVERHURON BAY	MAY 22-23	0	0	0	2.33	427.17	0	4.67	0	0	25.68	0	0	0	0	0	0	2.33	457.52	459.85
	JUNE 3-4	0	0	0	0	485.53	0	2.33	0	0	81.7	0	0	0	0	0	0	0	569.56	569.56
	JUNE 19-20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	JULY 2, 4	7	2.33	0	0	2.33	0	0	0	0	0	0	0	4.67	39.68	0	0	7	49.01	56.01
	AUGUST 7-8	0	518.21	0	0	0	0	14.01	0	0	0	0	0	11.67	0	0	0	0	543.89	543.89
	SEPTEMBER 4	0	0	0	0	4.67	0	18.67	0	0	0	0	0	0	0	0	0	0	23.34	23.34
	AVERAGE	1.17	86.76	0	0.39	153.28	0	6.61	0	0	17.9	0	0	2.72	6.61	0	0	1.56	273.89	275.44

through August 1985 are contained in Table 3.10 (data for individual samples in Appendix 9). The densities of larval fish collected in surface tows are summarized by location (1,3 and 7 m transects combined), date and species in Table 3.11, while results by transect (all locations combined), date and species are presented in Table 3.12 (data for individual samples in Appendix 10).

Rainbow smelt eggs dominated the April benthic sled samples (Table 3.9), with a total of 448 smelt eggs collected on April 24 and 26. In addition, 15 burbot eggs were collected in April. Larval fish collected in April benthic sled tows included 31 deep water sculpin, 2 burbot and a northern pike. The majority of smelt and burbot eggs were collected from the Bruce "B" discharge transect but there were insufficient samples to establish distinct spatial trends. Subsequent bottom tows with plankton nets at the Bruce "B" Intake transect from late May to early August were dominated by burbot and smelt larvae, which comprised 55% and 38% respectively, of the total fish larvae collected (Table 3.10). Most of the burbot and smelt larvae were collected in the first two sampling periods (May 22-23 and June 3-4). In contrast, alewife larvae (17) were only collected in August tows. Other species collected in May through August bottom tows included yellow perch, deep water sculpin, trout perch, cyprinid larvae, slimy sculpin and three coregonid larvae (a round whitefish, a lake whitefish and a cisco).

Ichthyoplankton collected in surface larval tows varied markedly, with estimated densities ranging from less than 10 to greater than 2,000 larvae/ 1000 m^3 (Tables 3.11 and 3.12). Highest estimated densities were observed in the late spring samples (May 22-23 and June 3-4), when smelt and burbot were the dominant species. Larval densities decreased markedly in mid-June then rose as alewife appeared in the collections. Substantial numbers of alewife eggs and larvae first appeared in the July 2-4 samples, with maximal densities of alewife larvae observed in the August 7-8 collections. In September, larval densities again decreased. Other species collected throughout the sampling period included: longnose sucker (May), white sucker (May-June), round whitefish (May-July), yellow perch (June-August), slimy sculpin (June-September), johnny darter (July-August), trout perch (July-August) and carp (July).

The temporal patterns in ichthyoplankton abundance generally corresponded with the life history of the principal fish species. Large numbers of rainbow smelt eggs were collected in the April 24 and 26 tows but not in April 12 tows, suggesting that in 1985, smelt in the study area spawned between April 12 and April 24. These results were in agreement with reports that rainbow smelt in the Great Lakes spawn in the early spring (Scott and Crossman 1973). The appearance of larvae in late May samples is consistent with the 30-35 day period to hatch which is predicted by a laboratory study of the effects of temperature on development of smelt embryos (OHRD Report No. 78-343-K). Similarly, the collection of burbot eggs and larvae, and deepwater sculpin larvae in April is in accord with the late winter-early spring spawning of these species (Scott and Crossman 1973). Alewife

TABLE 3.12
LARVAL FISH DENSITIES IN SURFACE TOWS - BRUCE GS "B" COMMISSIONING SURVEY, 1985
(larvae/ 1000 m**3)

SPECIES

	ALEWIFE egg	ALEWIFE larvae	ROUND WHITEFISH	SMELT egg	SMELT larvae	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	BURBOT	TROUT-PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
MAY 22-23,1985																			
1m	0	0	0	3.5	841.21	0	0.88	3.5	0.88	44.64	0	0	0	0	0	0	3.5	891.11	894.61
3m	0	0	0	3.57	852.68	0	0.89	0	0	58.93	0	0	0	0	0	0	3.57	912.5	916.07
7m	0	0	0.88	0	578.61	0	0.88	0.88	0	93.66	0	0	0	0	0	0	0	674.89	674.89
AVERAGE	0	0	0.29	3.21	752.51	0	0.88	1.46	0.29	71.78	0	0	0	0	0	0	3.21	827.21	830.42
JUNE 3-4, 1985																			
1m	0	0	0	0	294.99	0	0.88	0.88	0	170.69	0	0	0	0	0	0	0	467.44	467.44
3m	0	0	0	0	525.21	0	0	0.88	0	294.12	0	0	0	0	0	0	0	820.2	820.2
7m	0	0	0.88	0	464.81	0	0	0	0	317.75	0	0.88	0	0	0	0	0	784.31	784.31
AVERAGE	0	0	0.29	0.29	428.63	0	0.29	0.58	0	267.57	0	0.29	0	0	0	0	0.29	697.65	697.95
JUNE 19-20, 1985																			
1m	0	0	0	0	4.31	0	1.08	0	0	0	0	0	0	0	0	10.77	0	16.16	16.16
3m	0	0	0	0	0.88	0	0.88	0	0	0	0	0.88	0	0	0	0.88	0	3.5	3.5
7m	0	2.63	0	3.5	5.25	0	2.63	0	0	0.88	0	2.63	0	0	0	0	3.5	14.01	17.51
AVERAGE	0	0.93	0	1.24	3.42	0	1.56	0	0	0.62	0	1.24	0	0	0	3.42	1.24	11.2	12.45
JULY 2-3, 1985																			
1m	10.77	91.58	0	0	2.15	3.23	35.55	0	0	2.15	5.39	0	8.62	14.01	7.54	5.39	18.32	168.07	186.38
3m	116.42	3.5	0	0	0	0	1.75	0	0	2.63	0.88	55.15	0	18.38	1.75	6.13	118.17	88.41	206.58
7m	19.26	0.88	0.88	0	0.88	0	7.88	0	0	0	0.88	7	1.75	29.76	0.88	8.75	20.13	58.65	78.78
AVERAGE	51.35	28.01	0.31	0	0.95	0.93	13.69	0	0	1.56	2.18	22.1	3.11	21.16	3.11	6.85	54.47	100.84	155.31
AUGUST 7-8, 1985																			
1m	0	691.53	0	0	0	0	14.88	0	0	0	26.26	1.75	49.02	0	0	0	0	783.44	783.44
3m	0	614.5	0	0	1.75	0	4.38	0	0	0	16.63	0.88	43.77	0	0	0	0	681.9	681.9
7m	0	567.23	0	0	0.88	0	0.88	0	0	0	7.88	0	48.14	0	0	0	0	625	625
AVERAGE	0	624.42	0	0	0.88	0	6.71	0	0	0	16.92	0.88	46.98	0	0	0.29	0	697.07	697.07

TABLE 3.12
LARVAL FISH DENSITIES IN SURFACE TOWS - BRUCE GS "B" COMMISSIONING SURVEY, 1985
(larvae/ 1000 m**3)

SPECIES

	ALEWIFE eggs	ALEWIFE larvae	ROUND WHITEFISH	SMELT eggs	SMELT larvae	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	BURBOT	TROUT-PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
SEPTEMBER 3, 1985																			
1m	0	3.5	0	0	5.25	0	5.25	0	0	0	0	0	0	0	0	0	0	14.01	14.01
3m	0	12.25	0	0	3.5	0	3.5	0	0	0	0	0	0	0	0	0	0	19.26	19.26
7m	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7
AVERAGE	0	7.59	0	0	2.92	0	2.92	0	0	0	0	0	0	0	0	0.58	0	14.01	14.01

in the Great Lakes are reported to spawn in late June-July (Scott and Crossman 1973) and significant numbers of alewife eggs and larvae were first collected in surface larval tow nets in the beginning of July.

Both the temporal sequence and estimated densities of ichthyoplankton observed in 1985 were qualitatively similar to previous surveys at the BNPD. The sequential dominance of ichthyoplankton by burbot and smelt in the spring and early summer, followed by alewife later in the summer was similar to that observed in previous years (OHRD Report No. 82-107-K; OHRD Report No. 83-507-K). The peak densities of larval smelt (>1000/m^3) in surface tows were in the same general range as densities of 1600-3300 reported in 1980-1983 (OHRD Report No. 83-507-K). Similarly, the maximum densities of burbot and alewife larvae (>1000/m^3) were of the same order as values reported in earlier surveys at BNPD (OHRD Report No. 82-107-K; OHRD Report No. 87-185-K). As this was the first year of benthic sled tows at the BNPD, comparable data for other years were not available.

In general, ichthyoplankton were fairly evenly distributed along the 1, 3 and 7m depth contours (Table 3.12), however, round whitefish were only collected from the offshore (7m) contour. Although total densities of larval fish varied up to tenfold among locations on a given sampling interval, densities at a given location also varied markedly with time and no consistent spatial patterns in larval densities were apparent (Table 3.11). If burbot larvae were excluded, however, densities of larval fish in the Bruce "B" forebay were generally lower than those at other sampling locations. In particular, relatively few smelt and no alewife larvae were collected in the forebay, even when high densities of these larvae were collected at other sampling sites. Burbot differed from this pattern with higher densities of burbot larvae observed in the Bruce "B" forebay in the samples of May 22-23 and June 3-4 than were observed at most other locations during these sampling intervals. The difference between burbot and smelt larvae is also evident in comparing the ratio of smelt to burbot larvae in surface and bottom tows off the Bruce "B" intake. In the May 22-23 and June 3-4 samples off the Bruce "B" intake, the ratios of smelt larvae to burbot larvae in the surface tows were 10.6/1 and 1.6/1, respectively, while the ratios for bottom tows at the same location and time was 0.6/1 for both dates.

The differences in ichthyoplankton densities between the Bruce "B" forebay and other sites may reflect differences in susceptibility of the various species to entrainment by the submerged offshore intake at Bruce "B". Smelt and alewife spawn in the nearshore zone and larvae of both species are largely pelagic (Scott and Crossman 1973), although alewife tend to remain nearshore as they develop, while smelt move offshore to deeper waters (OHRD Report No. 83-451-K; OHRD Report No. 87-185-K). Consequently, although large numbers of smelt and alewife larvae were collected in surface tows, relatively few larvae may be entrained by the Bruce GS "B" intake and collected in the Bruce GS "B" forebay samples. Information concerning the larval ecology of burbot is limited but the relative ratios of burbot to

smelt larvae in surface and bottom tows at the Bruce GS "B" intake forebay suggest that burbot larvae are more demersal than rainbow smelt. Burbot also predominated among icthyoplankton collected in a study of entrainment at Bruce GS "A" in 1985 (OHRD Report No. 86-190-K). The dominance of burbot in larval fish collections from the intake forebays of both Bruce GS "A" and "B" may thus reflect the greater vulnerability of demersal larvae to entrainment by the submerged intakes.

4.0 SUMMARY

1) Nearshore water temperatures increased from less than 5° C in April to a maximum of approximately 23° C in August, then decreased to 5° C or less from mid-November on. During summer stratification the temperature differential between the 2 and 5 m depths at the Bruce GS "B" discharge station was approximately 1° C greater than in 1984. From mid-July into October 1985, surface water temperatures at the discharge station were generally 1-2° C greater than the corresponding temperatures off Gunn Point. These temperature differences presumably resulted from the Condenser Cooling System heating the intake water to temperatures above the ambient surface temperature when the the summer thermocline was depressed below the Bruce "B" GS intake. As in other years, however, the thermal regime during summer stratification was highly unstable, with large temperature fluctuations caused by episodes of upwelling and downwelling. These fluctuations are characteristic of exposed nearshore environments of the Great Lakes.

2) In 1985, the values of water quality parameters were generally similar to those observed during the preoperational period (1979-1981) and previous commissioning surveys (1983-1984). The elemental composition of sediments collected in sediment tubes was also consistent with samples collected during preoperational studies (1979). Concentrations of heavy metals in the sediments were low.

3) In general, catches of adult and juvenile fish were similar to those of earlier preoperational and commissioning surveys. Alewife predominated in the catch, followed by yellow perch, longnose sucker, spottail shiner and white sucker. The proportion of yellow perch increased to approximately 20% of the total catch as compared to less than 12% in previous surveys.

4) Ichthyoplankton densities varied seasonally, with smelt and burbot dominating collections in the spring and early summer and large numbers of alewife larvae appearing later in the summer. These patterns were consistent with previous surveys at BNPD. In general, the estimated densities of burbot larvae in the Bruce GS "B" forebay were greater than open lake samples, while the estimated densities of

smelt and alewife larvae were lower in the Bruce GS "B" forebay samples. Demersal larvae, such as burbot, may thus be particularly vulnerable to entrainment by the submerged intake of Bruce GS "B".

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APPENDIX 1

WATER TEMPERATURES ASSOCIATED WITH GILL NETTING, 1985

DATES	TRANSECT	DEPTH	SET DAY 1				PULL & RESET				PULL DAY 3				TEMPERATURE RANGE		THERMOGRAPH LOCATION
			I-B	I-2	O-B	O-2	I-B	I-2	O-B	O-2	I-B	I-2	O-B	O-2	PROBE	THERMOGRAPH	
April	Bruce 'A'	3M	1.5	1.5	2.5	2.5	2.0	1.5	4.0	4.0	3.0	3.0	3.5	3.5	1.5 - 4.0		
11 Set	Intake	12M	4.5	4.5	4.4	4.4	3.5	3.5	4.0	4.0	4.0	3.8	-	-	3.5 - 4.5		
12 Reset																	
13 Pull	Douglas	3M	2.2	2.2	1.5	1.5	3.0	2.5	2.5	2.5	3.0	3.0	2.5	2.5	1.5 - 3.0	1.5 - 3.0	BNPD-THB 24-3
	Point	12M	1.3	1.3	1.3	1.3	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	1.3 - 2.5		
	Bruce 'B'	3M	3.0	2.6	5.5	5.5	5.5	6.0	6.2	6.2	3.0	3.0	5.8	5.8	2.6 - 6.2		
	Discharge	12M	4.5	4.5	2.5	2.0	5.0	5.5	3.2	2.8	2.5	2.5	3.0	3.0	2.0 - 5.5		
	Bruce 'B'	3M	1.6	1.6	2.0	2.0	3.0	3.0	2.8	2.0	2.5	2.5	2.5	2.5	1.6 - 3.0		
	Intake	12M	1.2	1.2	1.5	1.5	2.8	2.8	3.0	2.8	2.5	2.5	2.5	2.2	1.2 - 3.0		
	Holmes	3M	2.0	2.0	1.8	1.8	3.6	3.0	3.6	3.0	3.0	3.0	2.8	2.5	1.8 - 3.6		
	Bay	12M	1.5	1.5	1.5	1.5	3.0	2.8	3.0	3.0	2.5	2.5	2.5	2.5	1.5 - 3.0		
	Gunn	3M	1.8	1.8	1.5	1.5	2.8	2.8	3.2	3.0	2.8	2.5	2.5	2.5	1.5 - 3.0		
	Point	12M	1.2	1.2	1.0	1.0	3.0	3.0	3.0	3.0	2.5	2.5	2.0	2.0	1.0 - 3.0		
May	Bruce 'A'	3M	8.2	8.2	6.2	6.2	7.5	8.0	6.0	6.0	5.5	5.5	6.0	6.5	5.5 - 8.2		
27 Set	Intake	12M	6.0	6.0	6.0	5.7	6.0	6.0	5.0	5.5	5.5	5.4	5.4	5.4	5.0 - 6.0		
28 Reset																	
29 Pull	Douglas	3M	8.0	8.0	6.6	6.5	6.0	6.0	6.0	6.0	5.3	5.5	5.5	5.5	5.3 - 8.0	4.75 - 8.5	BNPD-THB 24-3
	Point	12M	5.6	5.7	5.5	5.6	5.5	5.5	5.5	5.5	5.0	4.9	5.0	5.0	4.9 - 5.7		
	Bruce 'B'	3M	8.0	10.6	7.0	7.0	6.5	7.0	6.5	6.5	5.0	5.8	4.9	4.9	4.9 - 10.6		
	Discharge	12M	5.5	5.6	5.6	5.6	6.0	6.0	6.0	5.5	7.5	7.5	6.0	7.0	5.5 - 7.5		
	Bruce 'B'	3M	7.0	7.4	6.6	6.6	6.0	6.0	5.5	5.5	5.8	5.8	6.0	6.0	5.5 - 7.4	3.5 - 6.0	BNPD-THB 23-3
	Intake	12M	6.5	6.3	6.2	6.2	5.2	5.2	5.4	5.5	5.5	5.5	5.3	5.3	5.2 - 6.5		
	Holmes	3M	7.0	7.0	7.5	7.5	6.5	6.5	6.5	6.5	6.3	6.0	6.0	5.8	5.8 - 7.5	5.25 - 7.5	BNPD-THB 20-3
	Bay	12M	6.5	6.6	6.5	6.5	5.5	6.0	5.5	5.5	5.8	5.5	5.5	5.5	5.5 - 6.6		
	Gunn	3M	8.1	8.1	7.4	7.7	7.0	7.1	6.2	6.4	5.7	6.3	5.8	5.8	5.7 - 8.1		
	Point	12M	7.0	6.9	6.6	7.0	5.5	5.5	5.0	5.1	5.3	5.3	5.1	5.1	5.0 - 7.0		
June	Bruce 'A'	3M	14.5	15.0	14.0	14.0	14.0	14.0	13.0	13.0	13.5	14.0	13.5	13.5	13.0 - 15.0		
24 Set	Intake	12M	14.0	14.0	14.0	14.0	12.8	12.8	12.5	12.5	12.5	12.5	12.5	12.5	12.5 - 14.0		
25 Reset																	
26 Pull	Douglas	3M	15.0	15.0	14.0	14.0	13.0	14.5	12.5	12.5	12.5	13.0	12.0	12.3	12.0 - 15.0	11.5 - 16.25	BNPD-THB 24-3
	Point	12M	13.0	13.0	12.0	12.0	12.5	12.5	12.5	12.5	11.5	11.5	11.5	11.5	11.5 - 13.0		
	Bruce 'B'	3M	14.5	15.0	14.0	14.0	14.2	14.5	12.5	14.0	12.5	13.0	12.0	14.3	12.0 - 15.0		
	Discharge	12M	14.0	14.0	12.0	12.0	12.5	12.5	12.0	12.5	12.0	12.0	11.0	11.0	11.0 - 14.0		
	Bruce 'B'	3M	14.0	14.0	13.5	13.8	12.8	13.8	12.5	12.5	13.0	14.0	12.5	12.5	12.5 - 14.0	12.75 - 15.5	BNPD-THB 23-3
	Intake	12M	13.5	13.6	13.5	13.5	12.3	12.7	12.3	12.3	12.0	12.0	11.5	11.5	11.5 - 13.6		

APPENDIX 1 (cont'd)

WATER TEMPERATURES ASSOCIATED WITH GILL NETTING, 1985

DATES	TRANSECT	DEPTH	SET DAY 1				PULL & RESET				PULL DAY 3				TEMPERATURE RANGE		THERMOGRAPH LOCATION
			I-B	I-2	O-B	O-2	I-B	I-2	O-B	O-2	I-B	I-2	O-B	O-2	PROBE	THERMOGRAPH	
	Holmes	3M	14.6	14.8	14.3	14.5	13.5	13.8	12.8	12.8	13.0	13.0	12.5	12.5	12.5 - 14.8	13.0 - 16.5	BNPD-THB 20-3
	Bay	12M	14.0	14.0	14.0	14.0	12.5	12.5	12.5	12.5	12.0	12.0	12.0	12.0	12.0 - 14.0		
	Gunn	3M	14.6	14.6	14.4	14.4	13.0	14.0	12.5	13.0	14.0	14.5	13.0	13.5	12.5 - 14.6		
	Point	12M	13.5	13.5	12.5	13.0	13.2	13.8	12.5	12.5	12.0	12.0	12.0	12.0	12.0 - 13.8		
July	Bruce 'A'	3M	13.5	15.5	12.0	12.0	18.5	18.5	17.0	17.5	17.5	17.5	17.5	17.5	12.0 - 18.5		
23 Set	Intake	12M	10.5	10.5	10.5	10.5	13.0	15.5	12.0	14.0	17.5	17.5	16.0	16.5	10.5 - 17.5		
24 Reset																	
25 Pull	Douglas	3M	16.5	18.0	14.5	15.0	18.5	19.0	16.0	16.5	18.0	18.5	17.0	17.5	14.5 - 19.0	15.5 - 21.0	BNPD-THB 24-3
	Point	12M	11.8	12.5	8.5	9.2	10.5	12.0	9.0	9.0	16.5	17.0	17.0	17.5	8.5 - 17.5		
	Bruce 'B'	3M	16.5	16.8	16.8	17.5	16.5	17.5	17.5	17.5	20.5	21.0	ND	ND	16.5 - 21.0		
	Discharge	12M	11.2	11.8	13.5	15.5	10.0	11.5	9.0	9.0	18.0	18.5	18.0	18.0	9.0 - 18.5		
	Bruce 'B'	3M	15.5	16.5	12.5	12.5	17.0	17.5	17.5	17.5	19.0	19.5	17.5	18.0	12.5 - 19.5		
	Intake	12M	11.8	12.0	9.5	10.8	12.5	15.0	9.5	9.5	17.0	17.5	17.0	17.5	9.5 - 17.5		
	Holmes	3M	15.5	16.5	13.0	13.2	16.5	17.0	16.8	17.5	19.0	20.0	19.0	19.0	13.0 - 20.0		
	Bay	12M	11.5	11.5	10.5	11.5	10.0	10.0	9.5	10.0	17.0	17.0	18.0	18.5	9.5 - 18.5		
	Gunn	3M	16.5	17.0	12.5	14.2	17.5	17.5	17.5	17.5	18.0	18.5	18.5	19.0	12.5 - 19.0		
	Point	12M	11.5	12.0	9.8	11.0	1.5	16.5	10.0	10.5	18.0	18.5	17.0	17.0	9.8 - 18.5		
August	Bruce 'A'	3M	15.5	16.0	11.5	12.0	17.0	17.0	13.5	17.0	ND	ND	ND	ND	12.0 - 17.0		
26 Set	Intake	12M	11.5	12.0	10.0	11.0	13.5	17.0	13.0	13.0	19.0	19.0	18.0	18.5	10.0 - 19.0		
27 Reset																	
28 Pull	Douglas	3M	16.0	17.0	13.5	15.5	17.5	17.0	15.0	16.0	19.0	19.0	17.5	17.5	13.5 - 19.0	14.5 - 20.0	BNPD-THB 24-3
	Point	12M	12.5	12.5	10.5	11.0	15.0	16.0	11.0	12.0	17.0	17.0	16.0	16.5	10.5 - 17.0		
	Bruce 'B'	3M	16.0	16.3	17.0	17.5	17.0	17.0	16.0	17.5	18.5	18.5	18.0	18.0	16.0 - 18.5		
	Discharge	12M	11.5	12.3	9.0	9.0	12.5	13.0	11.0	11.0	17.5	17.5	16.0	16.5	9.0 - 17.5		
	Bruce 'B'	3M	17.5	18.0	14.0	15.0	17.5	17.5	16.0	17.0	17.5	17.5	17.0	17.5	14.0 - 18.0	14.0 - 18.0	BNPD-THB 23-3
	Intake	12M	14.0	15.0	11.0	11.5	16.0	17.0	12.0	12.0	12.0	17.0	17.0	17.5	11.0 - 17.5		
	Holmes	3M	16.5	17.0	15.5	16.5	17.0	17.0	17.0	17.0	18.0	18.0	17.5	17.5	15.5 - 18.0	15.0 - 19.0	BNPD-THB 20-3
	Bay	12M	15.0	16.0	14.5	14.5	16.0	17.0	16.5	16.5	17.0	17.0	17.0	17.5	14.5 - 17.5		
	Gunn	3M	16.3	16.5	13.0	14.0	17.0	17.5	14.5	15.5	17.0	17.0	17.0	17.5	13.0 - 17.5		
	Point	12M	13.0	14.0	10.8	11.0	14.5	15.5	13.5	14.5	17.0	17.5	17.0	17.0	10.8 - 17.5		
			PULL				RESET				PULL						

APPENDIX 1 (cont'd)

WATER TEMPERATURES ASSOCIATED WITH GILL NETTING, 1985

DATES	TRANSECT	DEPTH	SET DAY 1				PULL & RESET				PULL DAY 3				TEMPERATURE RANGE		THERMOGRAPH LOCATION
			I-B	I-2	O-B	O-2	I-B	I-2	O-B	O-2	I-B	I-2	O-B	O-2	PROBE	THERMOGRAPH	
September	Bruce 'A'	3M	19.0	19.0	19.0	19.0	17.0	17.0	17.2	17.2	17.5	17.5	17.5	17.5	17.0 - 19.0		
23 Set	Intake	12M	18.0	18.5	18.5	18.5	17.2	17.2	17.2	17.2	17.0	17.5	16.5	17.0	16.5 - 18.5		
26 Reset																	
27 Pull	Douglas	3M	19.0	9.0	18.0	18.0	17.0	17.0	17.0	17.0	16.5	16.5	16.5	16.5	16.5 - 19.0	12.5 - 19.5	BNPD-THB 24-3
	Point	12M	18.0	18.0	18.0	18.0	17.0	17.0	16.8	16.8	16.0	16.0	16.0	16.0	16.0 - 18.0		
24																	
25 Storms	Bruce 'B'	3M	20.0	20.5	18.5	18.5	18.5	18.5	16.8	16.8	17.5	17.5	16.0	16.0	16.0 - 20.5		
	Discharge	12M	18.5	18.5	18.5	18.5	16.6	16.6	16.0	16.0	15.5	15.5	15.5	15.5	15.5 - 18.5		
	Bruce 'B'	3M	18.5	18.5	18.4	18.4	18.0	18.0	17.0	17.0	17.0	17.0	16.5	16.5	16.5 - 18.5	16.0 - 20.5	BNPD-THB 23-3
	Intake	12M	18.5	18.5	18.0	18.0	17.0	17.0	15.5	15.5	15.5	15.5	16.0	16.0	15.5 - 18.5		
	Holmes	3M	18.6	18.6	18.5	18.5	17.0	17.0	17.0	17.0	16.2	16.2	16.0	16.0	16.0 - 18.6	17.0 - 20.0	BNPD-THB 20-3
	Bay	12M	18.0	18.0	18.2	18.2	17.0	17.0	17.0	17.0	15.5	15.5	15.5	15.5	15.5 - 18.0		
	Gunn	3M	18.3	18.3	18.3	18.3	16.5	16.5	16.5	16.5	16.0	16.0	15.5	15.5	15.5 - 18.3		
	Point	12M	18.5	18.5	18.5	18.5	16.5	16.5	15.5	15.5	15.8	15.8	15.8	15.8	15.8 - 18.5		
October	Bruce 'A'	3M	11.0	11.5	12.0	11.5	11.5	11.5	11.0	11.0	11.0	11.5	10.0	10.0	10.0 - 12.0		
29 Set	Intake	12M	12.0	11.5	12.0	11.5	11.0	11.0	11.0	11.0	10.0	10.0	11.5	12.0	10.0 - 14.0		
30 Reset																	
31 Pull	Douglas	3M	11.5	12.0	11.5	11.5	11.0	11.0	11.0	11.0	12.0	12.0	11.0	12.0	11.0 - 12.0		
	Point	12M	11.5	11.5	12.5	12.5	11.0	11.0	11.0	11.0	11.0	12.5	10.2	12.5	11.0 - 12.5		
Br A Int	Bruce 'B'	3M	12.0	12.0	11.5	11.5	11.0	11.0	11.0	11.0	12.0	12.0	12.0	12.0	11.0 - 12.0		
Pulled	Discharge	12M	11.5	11.5	12.0	11.5	11.0	11.0	11.0	12.75	12.0	12.0	8.5	12.0	8.5 - 12.75*		
on 30 but																	
Reset 31	Bruce 'B'	3M	10.5	10.5	11.5	11.5	11.0	11.0	10.5	10.5	9.5	10.0	9.0	9.0	9.0 - 11.5		
Pulled	Intake	12M	11.5	11.5	11.5	11.0	10.5	10.5	11.0	11.0	9.0	9.0	8.5	8.5	8.5 - 11.5		
Nov 1																	
	Holmes	3M	10.5	10.5	10.5	10.5	11.0	11.0	10.5	10.5	10.0	9.5	9.0	9.0	9.0 - 11.0	8.0 - 12.5	BNPD-THB 20-3
	Bay	12M	10.5	10.5	10.5	10.5	10.5	10.5	10.5	11.0	9.0	9.0	9.5	9.5	9.0 - 11.0		
	Gunn	3M	10.5	10.5	10.5	10.5	11.5	11.0	10.5	10.5	10.0	9.5	8.5	9.0	8.5 - 11.0		
	Point	12M	10.5	10.5	10.5	10.5	10.5	10.5	9.5	9.0	8.5	9.0	7.5	7.5	7.5 - 10.5		
November	Bruce 'A'	3M	-	-	-	-	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5 - 6.0		
25 Set	Intake	12M	-	-	-	-	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5 - 6.5		
26 Reset																	
28 Pull	Douglas	3M	5.5	5.5	5.5	5.5	6.0	6.2	6.0	6.0	6.0	6.0	6.0	6.0	5.5 - 6.2		
	Point	12M	5.5	5.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	-	5.5 - 6.5		
Br A Int																	
26 Set	Bruce 'B'	3M	5.5	5.5	6.0	6.5	5.5	5.5	6.0	6.0	6.5	6.5	6.0	6.0	5.5 - 6.5		
28 Pull	Discharge	12M	6.0	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	-	5.0 - 6.5		

APPENDIX 1 (cont'd)

WATER TEMPERATURES ASSOCIATED WITH GILL NETTING, 1985

DATES	TRANSECT	DEPTH	SET DAY 1				PULL & RESET				PULL DAY 3				TEMPERATURE RANGE		THERMOGRAPH LOCATION
			I-B	I-2	O-B	O-2	I-B	I-2	O-B	O-2	I-B	I-2	O-B	O-2	PROBE	THERMOGRAPH	
	Bruce 'B'	3M	6.5	6.5	6.0	6.0	5.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0 - 6.5	4.5 - 10.5	BNPD-THB 23-3
	Intake	12M	6.0	6.0	6.0	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	-	6.0 - 6.5		
	Holmes	3M	5.0	5.0	5.5	5.5	5.5	5.5	6.0	6.0	6.0	6.0	5.5	5.5	5.0 - 6.0		
	Bay	12M	5.5	5.5	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	6.0	-	5.5 - 6.0		
	Gunn	3M	5.5	5.5	5.5	6.0	4.5	5.0	5.0	5.5	6.0	6.0	6.0	6.0	4.5 - 6.0		
	Point	12M	5.5	6.0	5.5	5.5	5.0	5.5	5.5	5.5	6.0	6.0	5.5	-	5.0 - 6.0		
December	Bruce 'A'	3M	5.5	5.5	4.9	4.9	4.7	4.7	4.7	4.7	5.0	5.0	5.5	5.5	4.7 - 5.5		
9 Set	Intake	12M	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	5.5	5.5	5.7	5.7	4.7 - 5.7		
10 Reset																	
11 Pull	Douglas	3M	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	6.3	6.3	6.3	6.3	4.5 - 6.3		
	Point	12M	4.5	4.5	5.0	5.0	4.7	4.7	4.7	4.7	6.3	6.3	5.3	5.3	4.5 - 6.3		
	Bruce 'B'	3M	4.8	4.8	5.5	6.0	5.5	6.5	5.0	6.0	6.0	7.0	6.0	6.5	4.8 - 7.0		
	Discharge	12M	3.5	3.5	4.0	4.0	4.2	4.5	4.5	4.5	6.0	6.0	4.5	4.5	3.5 - 6.0		
	Bruce 'B'	3M	2.7	2.7	3.0	3.0	3.0	3.0	3.3	3.3	3.5	3.5	3.5	3.5	2.7 - 3.5		
	Intake	12M	3.4	3.4	4.0	4.0	4.0	4.0	4.2	4.2	3.5	3.5	4.3	4.3	3.4 - 4.3		
	Holmes	3M	2.7	2.7	3.0	3.0	2.7	2.7	2.7	2.7	3.3	3.3	3.3	3.3	2.7 - 3.3		
	Bay	12M	3.0	3.0	3.0	3.0	2.7	2.7	2.7	2.7	3.0	3.0	3.0	3.0	2.7 - 3.0		
	Gunn	3M	2.6	2.3	3.0	3.0	3.0	3.0	3.0	3.0	3.2	3.2	3.5	3.5	2.3 - 3.2		
	Point	12M	3.2	3.2	3.2	3.2	3.0	3.0	3.0	3.0	3.7	3.7	4.0	4.0	3.0 - 4.0		

APPENDIX 2

Current Records at Bruce NGS "B" During Gill Netting April-November 1985
Velocity (cm/s) and Direction (Velocity > 0)

DATE	TIME (h) 1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00
APRIL 12	-	-	-	-	-	-	-	-	-	-	-	-	-	5	4	6	5	3	3	3	0	0	0	0
														N	N	N	NNE	NNE	NNE	N				
APRIL 13	0	0	0	0	0	0	0	0	0	0	3	0	0	3	8	6	7	6	7	8	8	9	9	10
											N			N	N	NNE	N	NNE	N	NNE	NNE	N	N	N
MAY 27	0	0	3	4	4	4	6	7	9	8	8	8	8	9	8	8	10	0	0	9	10	12	13	10
			SW	SW	WSW	SW	W	W	WSW	W	W	WSW	W	NW	W	W	W			W	W	WNW	W	W
MAY 28	10	11	12	13	16	15	13	14	13	13	13	12	12	11	12	2	2	2	3	3	2	3	3	12
	W	WNW	W	WNW	W	W	W	W	W	W	W	W	W	W	W	W	WNW	W	W	W	W	WSW	WSW	W
MAY 30	11	9	9	7	5	3	3	3	0	0	0	3	3	0	0	0	0	0	0	0	0	0	3	3
	W	W	W	W	W	W	WSW	WSW				WSW	WSW										WSW	WSW
JUNE 24	10	10	11	8	8	11	13	14	13	10	11	11	11	12	14	14	16	21	18	15	15	13	13	9
	NNE	N	N	N	N	N	N	N	NNE	NNE	NNE	N	N	N	N	N	N	N	N	N	NNE	NNE	N	N
JUNE 25	7	7	9	8	5	6	4	4	5	6	5	4	4	3	3	3	4	5	6	6	6	5	4	4
	N	NNE	NNE	NNE	NNE	NNE	N	N	NNE	NNE	NNE	N	NNE	N	N	N	N	NNE	NNE	NNE	NNE	NNE	NNE	N
JUNE 26	4	5	4	0	0	0	0	0	0	0	3	4	6	3	0	0	0	0	0	3	0	0	0	0
	N	NNE	NNE								ENE	ENE	E	ENE						ESE				
JULY 23	10	9	8	8	8	8	8	7	8	8	8	8	9	9	9	8	8	6	5	0	0	0	0	0
	W	WNW	W	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	SW	SW	WSW	W	WNW	WNW	WNW	NW					
JULY 24	6	9	10	9	8	7	8	10	8	9	10	8	7	7	7	5	5	6	5	5	8	5	6	9
	SW	SE	SE	SSE	SSE	SSW	SW	W	W	W	SSE	SE	SE	SE	SSE	SSW	SSW	SSW	SW	SW	SW	ENE	N	NE
JULY 25	12	13	5	20	24	33	27	20	19	18	18	16	15	16	17	16	16	15	14	11	11	9	8	9
	NNE	NE	NE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	NE	ENE	ENE	ENE	ENE	ENE	ENE	NE
AUGUST 26	7	6	6	8	9	10	10	12	10	10	9	8	9	7	9	10	8	6	8	10	7	8	8	8
	N	N	N	N	N	N	N	N	N	N	N	N	N	NNE	NNE	N	N	N	N	N	N	N	N	N
AUGUST 27	8	13	12	12	8	16	15	14	12	12	12	12	15	13	12	20	23	22	20	16	15	16	15	14
	N	N	NNW	NNW	NNW	NNW	N	N	N	NNE	NNE	NE	NNE	N	N	N	N	N	N	N	N	N	N	NNW
AUGUST 28	12	17	25	24	23	21	22	20	18	19	17	19	18	17	15	15	13	13	13	13	12	12	10	10
	NNE	NNE	NNE	NNE	NNE	N	NNE	NNE	NNE	N	N	N	N	N	N	N	N	N	N	N	N	NNE	NNE	NNE

APPENDIX 2

Current Records at Bruce NGS "B" During Gill Netting April-November 1985
Velocity (cm/s) and Direction (Velocity > 0)

DATE	TIME (h) 1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00
SEPTEMBER 2	12	10	10	9	8	9	8	8	8	8	8	8	8	8	7	6	6	6	5	3	0	0	0	0
	NE	NE	NE	NE	NE	NE	NE	NNE	NNE	NNE	NE	NNE	NE	ENE	ENE	ENE	ENE	ENE	ENE	NE				
SEPTEMBER 2	0	3	4	7	6	7	7	5	5	5	5	6	8	8	7	8	8	7	7	6	7	7	7	8
		WSW	W	WNW	WSW	W	WNW	W	W	W	WSW	WNW	SSE	E	ENE	ENE	NE	NE	NE	ENE	ENE	E	N	NW
SEPTEMBER 2	7	7	7	7	7	6	7	6	8	7	7	7	6	7	8	7	8	8	8	8	8	8	7	6
	W	NW	WNW	NW	N	N	N	NE	NE	ENE	E	E	SE	SSW	SSW	SSW	SW	WSW	WSW	WSW	WSW	W	W	W
OCTOBER 29	5	7	10	10	10	11	12	12	11	11	12	11	9	8	6	5	6	7	12	14	15	14	12	11
	SSW	SSW	S	S	S	S	S	S	S	S	S	S	SSW	S	S	S	S	S	S	S	S	S	S	S
OCTOBER 30	10	11	11	12	15	15	15	17	18	11	13	13	16	19	21	21	20	13	11	7	6	7	8	10
	S	S	S	S	S	SSW	S	S	SSW	SSW	S	S	S	S	S	S	S	S	S	S	S	S	SSW	SSW
OCTOBER 31	10	14	15	14	14	13	10	8	11	11	8	4	3	4	3	0	0	0	13	6	5	6	7	4
	SSW	SSW	S	S	S	S	S	S	S	S	S	SSE	SSE	S	SSW				S	SSE	SSE	S	SSW	WSW
NOVEMBER 1	0	0	0	0	0	0	5	10	7	0	5	5	5	4	3	4	0	0	0	5	0	5	6	4
							SSE	SSE	SE	RE	SE	SSE	SSE	SE	SSE	SE				WNW		NW	NW	NNW
NOVEMBER 25	13	11	11	10	10	8	7	6	6	7	6	5	5	6	4	5	3	0	0	0	3	3	0	4
	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SW	SSW	SSW	SSW	SSW	SSW	SW	SSW	SW				NW	NNW		NNW
NOVEMBER 26	4	5	4	5	7	9	9	9	8	7	4	5	4	4	4	0	4	3	0	3	0	0	0	3
	N	NNW	N	N	N	NNW	NNW	NNW	N	N	N	N	NNW	NW	NNW		N	NNW		NW				NW
NOVEMBER 27	3	4	6	9	10	10	10	9	9	9	8	9	8	8	6	6	5	5	5	3	3	3	3	0
	NW	NNW	NNW	NNW	NNW	N	NNW	NNW	NNW	NNW	NNW	NNW	NNW	N	NNE	NNW	N	NNW	NNE	NW	WNW	NNW	NNW	

APPENDIX 3

WATER QUALITY ANALYSES, BRUCE GS "B", 1985

Date	June 6			August 8			November 1		
Location	A	B	C	A	B	C	A	B	C
pH	7.6	7.8	7.8	7.8	7.9	8.0	8.0	8.1	8.1
Colour	None	None	None	None	None	None	None	None	None
Conductivity (ms/m)	20.5	20.5	20.5	20.6	20.3	20.4	19.5	20.5	20.5
Turbidity (NTU)	0.7	1.0	1.3	0.36	0.30	0.36	0.35	0.18	0.32
Alkalinity ($mgCaCo_3/L$)	79	78	78	78	78	78	75.1	78.5	75.7
Dissolved Solids (mg/L)									
105°C (Volatile)	110	122	122	134	125	158	113	110	114
550°C (Non-Volatile)	75	90	88	126	112	145	97	80	91
Suspended Solids (mg/L)									
105°C (Volatile)	<2	<2	2	<2	<2	<2	<2	<2	<2
550°C (Non-Volatile)	<2	<2	<2	<2	<2	<2	<2	<2	<2
Total Phosphorus (µg/L)	8.	7.	7.	6.	7.	6.	7.	9.	13.
Soluble Phosphorus (µg/L)	5.0	6.0	5.0	-	-	-	-	-	-
Orthophosphate (µg/L)	<5.0	<5.0	<5.0	-	-	-	<5.0	<5.0	<5.0
Total Silica (mg/L)	1.71	1.94	1.98	0.81	0.59	0.60	1.3	1.3	1.6
Soluble Silica (mg/L)	1.17	1.43	1.43	0.59	0.48	0.49	1.3	1.3	1.4
Total Kjeldahl Nitrogen (mgN/L)	0.44	0.19	0.29	0.36	0.21	0.29	0.17	0.19	0.19
Nitrite Nitrogen (mgN/L)	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Nitrate Nitrogen (mgN/L)	0.30	0.31	0.32	0.30	0.30	0.30	0.444	0.432	0.441
Ammonia (mgNH/L)	<0.008	<0.008	<0.008	<0.008	0.013	0.014	<0.008	<0.008	<0.008
Calcium (mg/L)	20.0	23.7	21.9	25.9	26.2	25.8	34.1	34.4	59.8*
Aluminum (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Potassium (mg/L)	0.671	0.815	0.763	0.950	0.931	0.973	0.88	0.90	0.89
Dissolved Iron (mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sodium (mg/L)	2.77	2.90	2.75	3.38	3.37	3.39	3.45	3.23	3.56
Sulphate (mg/L)	17.7	16.5	15.9	17.3	17.4	17.1	16.3	16.1	16.0
Chloride (mg/L)	6.3	6.3	6.2	6.2	9.8	6.2	5.6	5.7	5.7
Magnesium (mg/L)	6.26	7.03	6.44	6.94	6.98	6.98	6.84	6.77	7.41
Hardness ($mgCaCO_3/L$)	75.7	88.1	71.2	93.3	94.1	92.1	113	114	179*
Oil and Grease (mg/L)	0.6	1.2	0.2	<0.1	<0.1	<0.1	0.08	0.12	0.03

Locations: A = Bruce 'B' Discharge, 3 m contour - surface
B = Bruce 'B' Intake, 12 m contour - surface
C = Bruce 'B' Intake, 12 m contour - bottom

* Samples not used in calculation mean values.

(C24B)

APPENDIX 4

ELEMENTAL COMPOSITION OF SAMPLES COLLECTED IN SEDIMENTATION TUBES
(7 m DEPTH) AT INDICATED SITES DURING THE BRUCE "B" NGS, 1985 COMMISSIONING SURVEY

ELEMENTS		METHOD OF ANALYSIS		COLLECTION PERIOD																			
				JUNE 20 - AUGUST 28												AUGUST 29 - NOVEMBER 11							
				DOUGLAS POINT (7 m)				BRUCE "B" DISCHARGE (7 m)				GUNN POINT (7 m)				GUNN POINT (7 m)				BRUCE "B" DISCHARGE (7 m)			
		AAA	NAA	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Calcium	g/kg	x		115.00	120.00	119.00	119.00	123.00	115.00	125.00	125.00	110.00	108.00	104.00	109.00	110.00	110.00	110.00	110.00	120.00	120.00	119.00	120.00
Calcium	g/kg		x	111.00	115.00	110.00	110.00	122.00	114.00	122.00	124.00	111.00	106.00	103.00	95.00	210.00	111.00	115.00	112.00	124.00	120.00	120.00	120.00
Magnesium	g/kg		x	46.00	54.00	45.00	41.00	45.00	42.00	49.00	46.00	35.00	45.00	41.00	36.00	70.00	37.00	41.80	36.00	44.00	43.00	41.00	41.00
Iron	g/kg	x		20.50	22.70	20.50	20.20	16.20	14.70	16.70	17.50	33.50	23.70	31.50	32.00	10.50	10.20	11.20	10.50	10.70	10.70	11.50	11.50
Iron	g/kg		x	20.30	23.50	22.70	23.20	16.60	16.00	19.00	13.00	28.00	23.00	25.00	20.00	12.00	14.20	12.80	12.60	15.40	14.80	15.40	15.90
Aluminum	g/kg	x		14.00	11.70	13.50	12.20	10.50	11.20	11.70	12.50	15.50	17.00	17.50	16.50	6.50	6.25	6.50	6.25	6.70	7.00	7.20	7.00
Aluminum	g/kg		x	30.00	31.00	30.00	30.40	27.60	25.90	27.50	28.00	32.00	33.00	34.00	30.00	*169.00	28.00	29.00	28.00	26.10	25.50	25.90	25.80
Sodium	g/kg		x	4.50	4.60	4.00	5.00	5.20	5.00	5.50	4.70	5.20	5.50	5.60	4.00	12.00	10.00	9.50	9.8	9.00	7.00	8.00	9.00
Sulphur	g/kg	x		2.20	2.00	2.10	2.20	1.90	1.80	2.10	2.10	1.50	2.10	2.00	2.30	0.60	0.70	1.20	0.70	1.00	0.90	1.10	0.90
Titanium	g/kg	x		0.62	0.56	0.62	0.62	0.62	0.62	0.69	0.75	0.75	0.69	0.75	0.69	0.37	0.37	0.37	0.37	0.50	0.50	0.44	0.44
Titanium	g/kg		x	1.70	1.60	1.90	1.90	1.30	1.50	1.50	1.60	1.70	1.66	1.70	1.70	2.30	1.10	1.20	0.96	1.10	1.10	1.10	1.20
Manganese	ug/kg	x		335.00	325.00	295.00	325.00	320.00	320.00	350.00	350.00	355.00	335.00	350.00	330.00	345.00	285.00	285.00	285.00	285.00	285.00	290.00	290.00
Manganese	ug/kg		x	315.00	290.00	317.00	304.00	304.00	290.00	310.00	300.00	330.00	320.00	340.00	300.00	355.00	270.00	260.00	270.00	290.00	285.00	290.00	290.00
Strontium	ug/kg	x		240.00	250.00	245.00	240.00	345.00	325.00	350.00	350.00	192.00	200.00	205.00	200.00	200.00	200.00	200.00	200.00	385.00	385.00	390.00	390.00
Zinc	ug/kg	x		100.00	70.00	66.00	67.00	61.00	52.00	61.00	58.00	64.00	72.00	69.00	70.00	27.00	26.00	35.00	27.00	35.00	38.00	46.00	34.00
Chromium	ug/kg	x		65.00	70.00	65.00	55.00	40.00	40.00	40.00	45.00	135.00	75.00	115.00	110.00	35.00	40.00	45.00	35.00	35.00	35.00	40.00	40.00
Chromium	ug/kg		x	72.00	100.00	83.00	91.00	54.00	42.00	62.00	64.00	160.00	96.00	126.00	108.00	42.00	48.00	56.00	45.00	48.00	44.00	54.00	54.00
Rubidium	ug/kg		x	65.00	66.00	72.00	61.00	50.00	44.00	59.00	50.00	62.00	62.00	60.00	54.00	38.00	53.00	44.00	41.00	48.00	39.00	48.00	46.00
Cesium	ug/kg	x		<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	*<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00
Cesium	ug/kg		x	2.30	2.50	2.60	2.40	1.70	1.70	2.20	2.00	2.20	2.60	2.80	1.90	1.10	1.10	1.00	1.10	1.20	1.20	1.10	1.10
Barium	ug/kg	x		<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00	<50.00
Barium	ug/kg		x	300.00	300.00	320.00	316.00	265.00	240.00	310.00	360.00	310.00	290.00	300.00	230.00	330.00	380.00	320.00	320.00	350.00	340.00	320.00	300.00
Bromine	ug/kg		x	45.00	43.00	41.00	57.00	40.00	37.00	49.00	42.00	31.00	42.00	42.00	26.00	13.00	14.00	15.00	13.00	25.00	19.00	19.00	23.00
Vanadium	ug/kg	x		<30.00	<30.00	<30.00	<30.00	<30.00	<30.00	<30.00	<30.00	<30.00	<30.00	<30.00	<30.00	<30.00	<30.00	<30.00	<30.00	<30.00	<30.00	<30.00	<30.00
Vanadium	ug/kg		x	44.00	44.00	42.00	43.00	37.00	34.00	34.00	39.00	44.00	48.00	48.00	44.00	80.00	24.00	23.00	25.00	25.00	26.00	25.00	24.00
Copper	ug/kg	x		24.00	28.00	24.00	27.00	19.00	18.00	20.00	20.00	30.00	27.00	25.00	27.00	11.00	9.50	11.00	11.00	13.00	12.00	13.00	13.00
Nickel	ug/kg	x		25.00	24.00	22.00	22.00	17.00	15.00	17.00	17.00	30.00	24.00	28.00	30.00	10.00	8.00	9.00	9.00	11.00	10.00	12.00	11.00
Lanthanum	ug/kg		x	18.00	20.00	18.00	20.00	16.00	15.00	17.00	18.00	17.00	16.00	23.00	12.00	11.00	12.00	11.00	11.00	13.00	12.00	12.00	13.00
Lead	ug/kg	x		15.00	15.00	10.00	10.00	15.00	15.00	15.00	15.00	20.00	15.00	20.00	20.00	<10.00	<10.00	<10.00	<10.00	<10.0	<10.00	<10.00	<10.00
Scandium	ug/kg		x	6.10	6.60	6.69	6.80	5.30	5.20	6.10	6.20	6.00	6.70	6.50	5.00	3.70	4.40	3.80	3.80	4.80	4.60	4.70	4.80
Cobalt	ug/kg	x		5.00	6.00	6.00	<4.00	<4.00	<4.00	<4.00	<4.00	6.00	6.00	6.00	6.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00
Cobalt	ug/kg		x	7.80	8.30	8.60	8.60	6.50	6.50	7.60	7.50	8.20	8.80	8.60	6.90	4.80	5.50	4.80	4.80	6.00	5.50	5.70	5.80
Thorium	ug/kg		x	4.70	5.00	5.20	3.10	7.70	3.80	4.50	4.60	4.30	5.00	4.80	3.80	2.40	2.80	2.50	2.20	3.10	3.00	3.20	2.80
Arsenic	ug/kg	x		3.68	3.68	3.68	3.68	3.45	3.45	3.45	3.33	3.73	3.56	3.56	3.91	2.18	2.07	1.73	1.95	2.30	2.30	2.30	2.41
Arsenic	ug/kg		x	3.90	3.00	-	5.90	4.00	3.20	5.80	5.00	5.00	3.90	3.50	3.20	3.00	2.50	2.00	**	1.80	**	**	**
Samarium	ug/kg		x	2.60	2.80	2.50	3.30	2.20	2.20	2.70	2.80	2.50	2.70	3.10	1.40	1.60	1.90	1.60	1.40	2.10	1.80	1.80	2.10
Beryllium	ug/kg		x	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Cadmium	ug/kg	x		<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Ytterbium	ug/kg		x	1.20	1.20	1.50	1.30	1.10	0.88	1.10	1.40	1.10	1.10	1.10	0.84	0.76	0.81	0.78	0.72	0.95	0.28	0.28	0.82
Antimony	ug/kg		x	850.00	860.00	700.00	940.00	830.00	530.00	600.00	610.00	1700.00	1400.00	2200.00	1200.00	570.00	340.00	350.00	330.00	570.00	520.00	390.00	400.00
Selenium	ug/kg	x		750.00	700.00	700.00	800.00	650.00	650.00	700.00	650.00	450.00	650.00	550.00	700.00	250.00	250.00	400.00	300.00	350.00	350.00	350.00	400.00
Selenium	ug/kg		x	1700.00	1200.00	1200.00	1100.00	800.00	1200.00	1800.00	1500.00	1200.00	980.00	1300.00	940.00	550.00	<500.00	610.00	890.00	930.00	<300.00	670.00	990.00
Europium	ug/kg		x	640.00	660.00	690.00	640.00	530.00	510.00	620.00	600.00	570.00	620.00	610.00	500.00	420.00	530.00	440.00	440.00	550.00	500.00	520.00	560.00
Mercury	ug/kg	x		70.00	940.00	900.00	530.00	590.00	660.00	1280.00	890.00	60.00	700.00	900.00	800.00	600.00	760.00	100.00	800.00	220.00	740.00	70.00	60.00
Hafnium	ug/kg		x	420.00	440.00	480.00	460.00	420.00	450.00	480.00	470.00	400.00	440.00	440.00	320.00	290.00	350.00	290.00	280.00	390.00	460.00	370.00	420.00
Tanatalum	ug/kg		x	380.00	440.00	430.00	500.00	340.00	300.00	350.00	400.00	330.00	490.00	550.00	350.00	240.00	250.00	230.00	230.00	280.00	360.00	340.00	280.00
Terbium	ug/kg		x	390.00	400.00	400.00	450.00	320.00	320.00	360.00	420.00	360.00	400.00	410.00	300.00	220.00	250.00	220.00	210.00	280.00	280.00	280.00	260.00
Lutetium	ug/kg		x	220.00	230.00	270.00	250.00	180.00	480.00	220.00	250.00	230.00	220.00	220.00	160.00	150.00	160.00	140.00	140.00	200.00	200.00	210.00	180.00
Cerium	ug/kg		x	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dysprosium	ug/kg		x	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

* - Not Entered for Mean
** - Not Able to Analyze
AAA - Atomic Absorption Analysis
NAA - Neutron Activation Analysis

87-306

- A4-1 -

(C248)

APPENDIX 5
FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985
3.8cm - 12.7cm MESH NETS

DATE	SPECIES	LOC	BRUCE A INTAKE				DOUGLAS POINT				BRUCE "B" DISCHARGE				BRUCE "B" INTAKE				HOLMES BAY				GUNN POINT				TOTAL			
		DEP	3		12		3		12		3		12		3		12		3		12		3		12		3	12	OVERALL	CUE
		SET	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2				
85/04/12	ALEWIFE				7	10			1	2	7	3	3	45			1	2	1		1	6	3	1	3	19	15	100	115	5
	LONGNOSE SUCKER		10	6	3		5	1	1	1	17	35		7	5	3		4	8	8	3		12	5	3	5	115	27	142	6
	WHITE SUCKER		2				1	1			1	4			2	4		1	1	1		1	5	3			25	2	27	1
	ROUND WHITEFISH		3	2			3	2				5	2	1	1	1		1					1	1			19	4	23	1
	BURBOT		6	3	11	2	4		8	1	4		15	15	2		6	2	1	1	10	7	7	2	9	12	30	98	128	5
	GIZZARD SHAD		15	15	7	4	6	1			13	7		5	51	1			14	3		1	3	3		1	132	18	150	6
	LAKE CHUB			1														2	2	16	1		1	3			23	3	26	1
	BROWN TROUT		3								1											1	1				5	1	6	0
	YELLOW PERCH					1		1									1	1							1		1	4	5	0
	SMELT												1											1	3	2	1	6	7	0
	COHO SALMON		1	3		2						2		3					1								7	5	12	1
	RAINBOW TROUT										3	1				1											5	0	5	0
	WHITE BASS				1								1	1								2					0	5	5	0
	YELLOW PICKEREL		2																								2	0	2	0
	CHANNEL CATFISH					1																					0	1	1	0
	LAKE WHITEFISH			1																							1	0	1	0
	REDHORSE SUCKER											1															1	0	1	0
	CHINOOK SALMON																					1		1			1	1	2	0
	CARP						1									1				1							3	0	3	0
	FRESHWATER DRUM																										0	0	0	0
	BROWN BULLHEAD																										0	0	0	0
	SMALLMOUTH BASS																										0	0	0	0
	ROCK BASS																										0	0	0	0
	WHITE PERCH																										0	0	0	0
	STONECAT																										0	0	0	0
	SPOTTAIL SHINER																										0	0	0	0
	SAUGER																										0	0	0	0
	LAKE HERRING																										0	0	0	0
	LAKE TROUT																										0	0	0	0
																											0	0	0	0
	TOTAL		42	31	29	20	20	6	10	4	46	58	22	77	61	11	8	13	28	30	15	19	33	20	19	39	386	275	661	28

APPENDIX 5
FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985
3.8cm - 12.7cm MESH NETS

DATE	SPECIES	LOC	BRUCE A INTAKE				DOUGLAS POINT				BRUCE "B" DISCHARGE				BRUCE "B" INTAKE				HOLMES BAY				GUNN POINT				TOTAL			
		DEP	3		12		3		12		3		12		3		12		3		12		3		12					
		SET	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	3	12	OVERALL	CUE
85/05/28	ALEWIFE		250	125	149	9	170	16	191	11	155	6	23	1	329	28	49	8	157	28	7	15	533	118	38	1	1915	502	2417	101
	LONGNOSE SUCKER		8	5	3	3	15	2	7	6	4	1	8	4	7	1	6	2	14	4		6	11	16	10	4	88	59	147	6
	WHITE SUCKER			1			2	2								1			2				5				13	0	13	1
	ROUND WHITEFISH				1				2			1			1		4			1			1				4	7	11	0
	BURBOT		5	1	1	2	3	2	2	5	8	18	10	8	6	3	6	7	5		3	8	10	7	8	15	68	75	143	6
	GIZZARD SHAD																										0	0	0	0
	LAKE CHUB														1				5	3							9	0	9	0
	BROWN TROUT																			1							1	0	1	0
	YELLOW PERCH				1				1								1				1		1				1	4	5	0
	SMELT																										0	0	0	0
	COHO SALMON																										0	0	0	0
	RAINBOW TROUT																										0	0	0	0
	WHITE BASS																										0	0	0	0
	WALLEYE																										0	0	0	0
	CHANNEL CATFISH		1																								1	1	2	0
	LAKE WHITEFISH												1														0	0	0	0
	REDHORSE SUCKER																										0	0	0	0
	CHINOOK SALMON																										0	0	0	0
	CARP																										0	0	0	0
	FRESHWATER DRUM																										0	0	0	0
	BROWN BULLHEAD																										0	0	0	0
	SMALLMOUTH BASS																										0	0	0	0
	ROCK BASS																										0	0	0	0
	WHITE PERCH																										0	0	0	0
	STONECAT																										0	0	0	0
	SPOTTAIL SHINER																										0	0	0	0
	SAUGER																										0	0	0	0
	LAKE HERRING																										0	0	0	0
	LAKE TROUT																										0	0	0	0
	TROUT-PERCH												1														0	1	1	0
	TOTAL		264	132	155	14	190	22	203	22	167	26	43	13	344	33	66	17	183	37	11	29	561	141	56	20	2100	649	2749	115

APPENDIX 5

FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985

3.8cm - 12.7cm MESH NETS

DATE	SPECIES	LOC	BRUCE A INTAKE				DOUGLAS POINT				BRUCE "B" DISCHARGE				BRUCE "B" INTAKE				HOLMES BAY				GUNN POINT				TOTAL			
		DEP	3		12		3		12		3		12		3		12		3		12		3		12		3	12	OVERALL	CUE
		SET	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2				
85/06/25	ALEWIFE		273	185	10	24	88	100	58	34	33	11	60	69	15	80	49	3	60	91	22	16	66	195	89	8	1197	442	1639	68
	LONGNOSE SUCKER		12	11	14	7	13	15	10	7	21	7	8	8	6	9	7	3	19	9	15	7	4	10	8	3	136	97	233	10
	WHITE SUCKER		12	4	9	1	16	10	10	2	13	10	4	5	12	8	7	1	16	14	7	7	3	9	7	5	127	65	192	8
	ROUND WHITEFISH					2	1			1							1	1			1					1	1	7	8	0
	BURBOT			1			1			1	1		12	3		1	3	3			5	2		1		4	5	33	38	2
	GIZZARD SHAD																										0	0	0	0
	LAKE CHUB																			3							3	0	3	0
	BROWN TROUT																										0	0	0	0
	YELLOW PERCH		8	2	52	5	7	6	47	6		2	8	4		4	31	11	67	11	13	9	2	4	72	120	113	378	491	20
	SMELT													1				1							1	1	0	4	4	0
	COHO SALMON																										0	0	0	0
	RAINBOW TROUT																				1						0	1	1	0
	WHITE BASS										1	1															0	0	0	0
	WALLEYE				1			1	1		2			1	2	2			1					2			2	0	2	0
	CHANNEL CATFISH										2																10	3	13	1
	LAKE WHITEFISH						2	1			1																0	0	0	0
	REDHORSE SUCKER																										4	0	4	0
	CHINOOK SALMON																										0	0	0	0
	CARP										1	2							5	1							9	0	9	0
	FRESHWATER DRUM											2							1	1							4	0	4	0
	BROWN BULLHEAD																				1						0	1	1	0
	SMALLMOUTH BASS																										0	0	0	0
	ROCK BASS																										0	0	0	0
	WHITE PERCH																										0	0	0	0
	STONECAT																										0	0	0	0
	SPOTTAIL SHINER																										0	0	0	0
	SAUGER																										0	0	0	0
	LAKE HERRING																										0	0	0	0
	LAKE TROUT																										0	0	0	0
	TOTAL		305	203	86	39	128	133	126	51	73	35	92	91	35	104	98	23	169	130	65	41	75	221	177	142	1611	1031	2642	110

APPENDIX 5
FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985
3.8cm - 12.7cm MESH NETS

DATE	SPECIES	LOC	BRUCE A INTAKE				DOUGLAS POINT				BRUCE "B" DISCHARGE				BRUCE "B" INTAKE				HOLMES BAY				GUNN POINT				TOTAL			
		DEP	3		12		3		12		3		12		3		12		3		12		3		12		3	12	OVERALL	CUE
		SET	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2				
85/07/24	ALEWIFE		96	17	1	16	80	72		10	105	94	2	5	149	149		55	29	60		12	104	86		4	1041	105	1146	48
	LONGNOSE SUCKER		18	17		2	28	12	1	3	20	5	1	5	21	2	1	8	24	5	5	10	60	23	1	5	235	42	277	12
	WHITE SUCKER		5	6	1		11	10	1	1	11				4	1		4	20	16	1	3	8	8	1	1	100	13	113	5
	ROUND WHITEFISH												1	1			1										0	3	3	0
	BURBOT				1		1			4			2	8			4	1			2	2			4	1	1	29	30	1
	GIZZARD SHAD						1				1					3								1			6	0	6	0
	LAKE CHUB										7				2		0	1	2			0	3	0	3		14	4	18	1
	BROWN TROUT							1																			1	0	1	0
	YELLOW PERCH		6	1			9	8		1	26	7		7	7			3	34	84		7	55	7	3	12	244	33	277	12
	SMELT								2								1	22									0	25	25	1
	COHO SALMON																	2					1			1	1	3	4	0
	RAINBOW TROUT		1			1												1									1	2	3	0
	WHITE BASS																										0	0	0	0
	WALLEYE			4			1	1			3	2												1			12	0	12	1
	CHANNEL CATFISH		1																								1	0	1	0
	LAKE WHITEFISH																										0	0	0	0
	REDHORSE SUCKER							1			3	2		1	1												7	1	8	0
	CHINOOK SALMON																1	1									0	2	2	0
	CARP										2					1								1			4	0	4	0
	FRESHWATER DRUM			2																							2	0	2	0
	BROWN BULLHEAD																										0	0	0	0
	SMALLMOUTH BASS						2																1				3	0	3	0
	ROCK BASS																										0	0	0	0
	WHITE PERCH																										0	0	0	0
	STONECAT																										0	0	0	0
	SPOTTAIL SHINER																										0	0	0	0
	SAUGER																										0	0	0	0
	LAKE HERRING																										0	0	0	0
	LAKE TROUT																										0	0	0	0
	TOTAL		127	47	3	19	133	105	4	19	178	110	6	27	184	156	8	98	109	165	8	34	232	127	12	24	1673	262	1935	81

APPENDIX 5

FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985

3.8cm - 12.7cm MESH NETS

DATE	SPECIES	LOC	BRUCE A INTAKE				DOUGLAS POINT				BRUCE "B" DISCHARGE				BRUCE "B" INTAKE				HOLMES BAY				GUNN POINT				TOTAL			
		DEP	3		12		3		12		3		12		3		12		3		12		3		12		3	12	OVERALL	CUE
		SET	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2				
				n																										
85/08/27	ALEVIFE				115		3		64	17	6		169		2		5	62	6	5	105		3		181	2	25	720	745	32
	LONGNOSE SUCKER		14		15	14	14	12	17	28	6		7	29	21	2	25	19	12	9	12	6	28	4	18	35	122	225	347	15
	WHITE SUCKER		3		2	3	4	5	1	2	6	3		1	9			3	12	6		2	3			1	51	15	66	3
	ROUND WHITEFISH		1										1														1	1	2	0
	BURBOT				3																1						0	4	4	0
	GIZZARD SHAD					2		4		1						1						1				1	5	5	10	0
	LAKE CHUB				1												1				2						0	4	4	0
	BROWN TROUT																										0	0	0	0
	YELLOW PERCH		33		1	49	32	38			79	48		47	73		61	2	48	87	7	62	179	33	1	134	650	364	1014	44
	SMELT		3										1														3	1	4	0
	COHO SALMON												1														0	1	1	0
	RAINBOW TROUT																										0	0	0	0
	WHITE BASS																										0	0	0	0
	WALLEYE		1			1		1			3	1				1		1				1				1	7	4	11	0
	CHANNEL CATFISH					6		1										2								2	1	10	11	0
	LAKE WHITEFISH																										0	0	0	0
	REDHORSE SUCKER					1		1			1	1			1	1	1										5	2	7	0
	CHINOOK SALMON																										0	0	0	0
	CARP					1				1									2	1				1			4	2	6	0
	FRESHWATER DRUM					2												1						2			2	3	5	0
	BROWN BULLHEAD								2				4												1		0	7	7	0
	SMALLMOUTH BASS					1																					0	1	1	0
	ROCK BASS					1																					0	1	1	0
	WHITE PERCH											1															1	0	1	0
	STONECAT																										0	0	0	0
	SPOTTAIL SHINER																										0	0	0	0
	SAUGER																										0	0	0	0
	LAKE HERRING																										0	0	0	0
	LAKE TROUT																										0	0	0	0
	TOTAL		55	0	137	81	53	62	84	49	101	54	183	77	106	5	93	90	80	108	127	72	213	40	201	176	877	1370	2247	98

n - no set

APPENDIX 5

FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985

3.8cm - 12.7cm MESH NETS

DATE	SPECIES	LOC	BRUCE A INTAKE				DOUGLAS POINT				BRUCE "B" DISCHARGE				BRUCE "B" INTAKE				HOLMES BAY				GUNN POINT				TOTAL			
		DEP	3			12	3			12	3			12	3			12	3			12	3			12	3	12	OVERALL	CUE
		SET	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2				
			n		(3d)		n		(3d)		n		(3d)		n		n		n		(3d)		n		(3d)					
85/09/26	ALEWIFE															2				3		1		2	4		7	5	12	0
	LONGNOSE SUCKER			2	13	2		2	24	7		3	12	5				4		1	18	3		5	37	7	13	132	145	5
	WHITE SUCKER			5	18	5		5	27			9	9	3		4		9		12	23	12		13	25	6	48	137	185	7
	ROUND WHITEFISH			5	2			4	1	2		1	10	2		2				3	1	1		2	2		17	21	38	1
	BURBOT												1												1		0	2	2	0
	GIZZARD SHAD			4	2	1		5	4	3		2		2		4		2				2		7	1	1	22	18	40	1
	LAKE CHUB																								12		0	12	12	0
	BROWN TROUT							1																			1	0	1	0
	YELLOW PERCH				85	27		2	210	148		3	168	18		5		11		1	206	21		10	307	69	21	1270	1291	48
	SMELT																				1						0	1	1	0
	COHO SALMON					1																					0	1	1	0
	RAINBOW TROUT																										0	0	0	0
	WHITE BASS			1																							1	0	1	0
	WALLEYE			2				4	5	3			5	3		5		1		1				2	4	1	14	22	36	1
	CHANNEL CATFISH					1		1					1			1									1		2	3	5	0
	LAKE WHITEFISH																										0	0	0	0
	REDHORSE SUCKER																			2							2	0	2	0
	CHINOOK SALMON																										0	0	0	0
	CARP								3				2								1						0	6	6	0
	FRESHWATER DRUM				1				1			2				2				4	2			2			10	4	14	1
	BROWN BULLHEAD																										0	0	0	0
	SMALLMOUTH BASS					1			1																1		0	3	3	0
	ROCK BASS			3																							3	0	3	0
	WHITE PERCH							1													1						1	1	2	0
	STONECAT																				1				1		0	2	2	0
	SPOTTAIL SHINER																										0	0	0	0
	SAUGER																										0	0	0	0
	LAKE HERRING																										0	0	0	0
	LAKE TROUT																										0	0	0	0
	TOTAL		0	22	121	38	0	25	276	163	0	20	208	33	0	25	0	27	0	27	254	40	0	43	396	84	162	1640	1802	67

n - no set; 3d - 3 day set

APPENDIX 5
FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985
3.8cm - 12.7cm MESH NETS

DATE	SPECIES	LOC	BRUCE A INTAKE				DOUGLAS POINT				BRUCE "B" DISCHARGE				BRUCE "B" INTAKE				HOLMES BAY				GUNN POINT				TOTAL 3	TOTAL 12	OVERALL CUE	
		DEP	3		12		3		12		3		12		3		12		3		12		3		12					
		SET	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2				
85/10/30	ALEWIFE																										0	0	0	0
	LONGNOSE SUCKER			4	2	9	7	20	15	22	5	2	3	24	9	8	22	10	8	14	14	3	40	17	51	11	134	186	320	13
	WHITE SUCKER		3	1	4	1	1	7	15	3	7	2	4	2	4	2	3	3		3	11	2	2	4	2		36	50	86	4
	ROUND WHITEFISH		5		3		4	4		1	5	9			2	5	1		4		2		4	1			43	7	50	2
	BURBOT									3				2		2				1	1	1		1	1	2	4	10	14	1
	GIZZARD SHAD		3		5					1	13	6			1	17			14	42	1						96	7	103	4
	LAKE CHUB										1							1	1		4					2	1	7	8	0
	BROWN TROUT																										1	0	1	0
	YELLOW PERCH				1	1		8	12	2			1	4		1	2	2	1	1	1		1	4	2	11	16	39	55	2
	SMELT																										0	0	0	0
	COHO SALMON																										0	0	0	0
	RAINBOW TROUT																										0	0	0	0
	WHITE BASS																										0	0	0	0
	WALLEYE		4		4		2	5		3	9	2			4	13		1	4		2		1	1	1		45	11	56	2
	CHANNEL CATFISH		2		1			1			2										1		1				6	2	8	0
	LAKE WHITEFISH																										0	0	0	0
	REDHORSE SUCKER		2												1							1		1			4	1	5	0
	CHINOOK SALMON																										0	0	0	0
	CARP		1		1		1	1				2									1						5	2	7	0
	FRESHWATER DRUM		1					2			2	2			1	1											9	0	9	0
	BROWN BULLHEAD																										0	0	0	0
	SMALLMOUTH BASS																						2	1	2		3	2	5	0
	ROCK BASS																										0	0	0	0
	WHITE PERCH																					1					0	1	1	0
	STONECAT																										0	0	0	0
	SPOTTAIL SHINER				1		4																				4	1	5	0
	SAUGER																										0	0	0	0
	LAKE HERRING																										0	0	0	0
	LAKE TROUT																										0	0	0	0
	TOTAL		21	5	22	11	19	48	42	35	44	25	8	32	22	49	28	17	32	61	38	8	51	30	59	26	407	326	733	31

APPENDIX 5
FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985
3.8cm - 12.7cm MESH NETS

DATE	SPECIES	LOC	BRUCE A INTAKE				DOUGLAS POINT				BRUCE "B" DISCHARGE				BRUCE "B" INTAKE				HOLMES BAY				GUNN POINT				TOTAL			
		DEP	3		12		3		12		3		12		3		12		3		12		3		12		3	12	OVERALL	CUE
		SET	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2				
				(2d)		(2d)		(2d)		(2d)		(2d)		(2d)		(2d)		(2d)		(2d)		(2d)		(2d)		(2d)						
85/11/26	ALEWIFE									1																				
	LONGNOSE SUCKER				1	4	2	22	8	1	4	27	6	2	3	9	4	5	1	1	5	1	9	20	22	0	1	1	0
	WHITE SUCKER		1		1	4	3	8	5	4	2	10	1	1	3	6	5	1	7	1	13	5	10	9	7	32	125	157	5
	ROUND WHITEFISH		5		2	1	5		1		3						1	2	8	1	2		2			41	66	107	3
	BURBOT		4		7		2	5	8	1	3	8	7	2	1	3	1	1	1	2	3	1	3	2	9	26	7	33	1
	GIZZARD SHAD		2								4				1											19	55	74	2
	LAKE CHUB								1										1					1		7	0	7	0
	BROWN TROUT							3				1														1	2	3	0
	YELLOW PERCH													1												0	0	0	0
	SMELT																									0	4	4	0
	COHO SALMON																									1	0	1	0
	RAINBOW TROUT																									0	0	0	0
	WHITE BASS																									0	0	0	0
	WALLEYE		6				3		3	1	7	1		1	5		3		2			1	3			29	7	36	1
	CHANNEL CATFISH		1																							1	0	1	0
	LAKE WHITEFISH																									0	0	0	0
	REDHORSE SUCKER										1															1	0	1	0
	CHINOOK SALMON																									0	0	0	0
	CARP										1															1	0	1	0
	FRESHWATER DRUM										5			1	1	1	1									7	2	9	0
	BROWN BULLHEAD																									0	0	0	0
	SMALLMOUTH BASS												1													0	1	1	0
	ROCK BASS																									0	0	0	0
	WHITE PERCH							1																		0	1	1	0
	STONECAT																									0	0	0	0
	SPOTTAIL SHINER																									0	0	0	0
	SAUGER																									0	0	0	0
	LAKE HERRING																									0	0	0	0
	LAKE TROUT																									0	0	0	0
	TOTAL		0	19	0	11	9	15	39	27	7	30	47	15	8	14	19	15	9	20	5	23	8	27	32	38	166	271	437	13

2d - 2 day set

APPENDIX 5
FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985
3.8cm - 12.7cm MESH NETS

DATE	SPECIES	LOC	BRUCE A INTAKE				DOUGLAS POINT				BRUCE "B" DISCHARGE				BRUCE "B" INTAKE				HOLMES BAY				GUNN POINT				TOTAL			
		DEP	3		12		3		12		3		12		3		12		3		12		3		12		3	12	OVERALL	CUE
		SET	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2				
85/12/10	ALEWIFE				1				1	1																	0	3	3	0
	LONGNOSE SUCKER		1			2	1	2	4	8		1	2	4	3	1	2				3	1			3	3	9	32	41	2
	WHITE SUCKER					3	1	1	2	1	1		2	3	2	1	2		7	1	2	1	2	3	1	4	19	21	40	2
	ROUND WHITEFISH		3	1			1	3			3				3	2			2	2			1			2	21	2	23	1
	BURBOT			1	2	1	1		6	4	2		9	6	1		5		3	1		1	4	2	2		15	36	51	2
	GIZZARD SHAD			1			1					1			2	6											11	0	11	0
	LAKE CHUB		1																2		2			1	1		4	3	7	0
	BROWN TROUT																										0	0	0	0
	YELLOW PERCH								1	1			3														0	5	5	0
	SMELT						1										1			1							2	1	3	0
	COHO SALMON										1																1	0	1	0
	RAINBOW TROUT											1				1								1			3	0	3	0
	WHITE BASS																										0	0	0	0
	WALLEYE										1	3			1												5	0	5	0
	CHANNEL CATFISH																										0	0	0	0
	LAKE WHITEFISH			1																							1	0	1	0
	REDHORSE SUCKER																										0	0	0	0
	CHINOOK SALMON																										0	0	0	0
	CARP																										0	0	0	0
	FRESHWATER DRUM																										0	0	0	0
	BROWN BULLHEAD																										0	0	0	0
	SMALLMOUTH BASS																										0	0	0	0
	ROCK BASS																										0	0	0	0
	WHITE PERCH																										0	0	0	0
	STONECAT																										0	0	0	0
	SPOTTAIL SHINER																										0	0	0	0
	SAUGER										1																1	0	1	0
	LAKE HERRING		1				1																				2	0	2	0
	LAKE TROUT														1												1	0	1	0
																											0	0	0	0
	TOTAL		6	4	3	6	7	6	14	15	9	6	16	13	13	11	9	1	14	5	7	3	7	7	7	9	95	103	198	8

APPENDIX 6
FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985
2.5cm MESH NETS

DATE	SPECIES	LOC	BRUCE A INTAKE				DOUGLAS POINT				BRUCE "B" DISCHARGE				BRUCE "B" INTAKE				HOLMES BAY				GUNN POINT				TOTAL			
		DEP	3		12		3		12		3		12		3		12		3		12		3		12		3	12	OVERALL	CUE
		SET	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2				
85/04/12	LAKE CHUB			1																										
	SMELT		1	2						1							1	2	4	1							6	0	6	0.3
	SPOTTAIL SHINER																						4	2			9	4	13	0.5
																							3				3	0	3	0.1
	TOTAL		1	3	0	0	0	0	0	1	0	0	0	0	0	0	1	2	4	1	0	0	7	2	0	0	18	4	22	0.9
85/05/28	ALEWIFE		29	9	5						2		1		9	2	1	2		1			8	2			62	9	71	3.0
	LONGNOSE SUCKER																							1			1	0	1	0.0
	TROUT-PERCH		1	6											2					1			2				12	0	12	0.5
	SPOTTAIL SHINER		2	1		1	2			1					5	3			3	28			6	1			51	2	53	2.2
	BURBOT																									1	0	1	1	0.0
	SMELT		6	1	1	1	1			1						1					1			2			11	4	15	0.6
	LAKE CHUB			3			3						1		2	6			3	2			2	3	1		24	2	26	1.1
	TOTAL		38	20	6	2	6	0	0	2	2	0	2	0	18	12	1	2	6	32	1	0	18	9	1	1	161	18	179	7.5
85/06/25	ALEWIFE		30	12		37	12	3	25	17	3	10	135	76	18	5	2		1	1	9	3		2		6	97	310	407	17.0
	SPOTTAIL SHINER		15	11	8	1	22	6	5	2	6		2	1	15	40	2		85	41	16	4	47	71	5	2	359	48	407	17.0
	SMELT		2	9	3	5	4	1	2	12			7	11							1		10			4	26	45	71	3.0
	TROUT-PERCH									1																	0	1	1	0.0
	BURBOT																1										0	1	1	0.0
	YELLOW PERCH		2	3	2	1	1		24	1				7	3		3	1			1	3			4	6	9	53	62	2.6
	LAKE CHUB			3		1		10				1				18				7			15	16		1	70	2	72	3.0
	TOTAL		49	38	13	45	39	20	56	33	9	11	144	95	36	63	8	1	86	49	27	10	72	89	9	19	561	460	1021	42.5

APPENDIX 6
FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985
2.5cm MESH NETS

DATE	SPECIES	LOC	BRUCE A INTAKE				DOUGLAS POINT				BRUCE "B" DISCHARGE				BRUCE "B" INTAKE				HOLMES BAY				GUNN POINT				TOTAL			
		DEP	3		12		3		12		3		12		3		12		3		12		3		12		3	12	OVERALL	CUE
		SET	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2				
85/07/24	ALEWIFE		90	2	1	2	70	11		9	11	125	1		62	3		19	3			11	48	38			463	43	506	21.1
	LONGNOSE SUCKER																		2								2	0	2	0.1
	WHITE SUCKER																						1				1	0	1	0.0
	SPOTTAIL SHINER		4	6							4				15	4			36	27			21	5			122	0	122	5.1
	SMELT					4			6	7	1		11					11				8			4		1	51	52	2.2
	YELLOW PERCH										3								1	2			2				8	0	8	0.3
	LAKE CHUB		2	1			9				13				25			10	24	5		1		9	2		88	13	101	4.2
	LOGPERCH																		1								1	0	1	0.0
	TOTAL		96	9	1	6	79	11	6	16	32	125	12	0	102	7	0	40	67	34	0	20	72	52	6	0	686	107	793	33.0

APPENDIX 6
FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985
2.5cm MESH NETS

DATE	SPECIES	LOC	BRUCE A INTAKE				DOUGLAS POINT				BRUCE "B" DISCHARGE				BRUCE "B" INTAKE				HOLMES BAY				QUNN POINT				TOTAL			
		DEP	3		12		3		12		3		12		3		12		3		12		3		12		3	12	OVERALL	CUE
		SET	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2				
85/08/27	ALEWIFE										1						9					1					1	10	11	0.5
	LONGNOSE SUCKER																								1		0	1	1	0.0
	SPOTTAIL SHINER		8			5	7	10	1	4	2	1		4	10	1	1	4	3	9	1	2	5	2	1	1	58	24	82	3.6
	SMELT				3		1		2	1	1		10		29		3		1	5	2		2		2	2	39	25	64	2.8
	YELLOW PERCH					5	1																				1	5	6	0.3
	TOTAL		8	0	3	10	9	10	3	5	4	1	10	4	39	1	13	4	4	14	3	3	7	2	4	3	99	65	164	7.1
85/09/26	ALEWIFE																				1			18			18	1	19	0.7
	LONGNOSE SUCKER				1																1						0	2	2	0.1
	SPOTTAIL SHINER			1	2				10							1	3	1		1	9	1			10		3	36	39	1.4
	SMELT								3												1				2		0	6	6	0.2
	YELLOW PERCH				1																1						0	2	2	0.1
	LOGPERCH																				1						0	1	1	0.0
	LAKE CHUB																1										0	1	1	0.0
	LONGNOSE GAR																							1			1	0	1	0.0
	TOTAL		0	1	4	0	0	0	13	0	0	0	0	0	0	1	4	1	0	1	14	1	0	19	12	0	22	49	71	2.6
85/10/30	SPOTTAIL SHINER		1	1			3	2	1		1			1		1	1	1				3	1	1		1	11	8	19	0.8
	LONGNOSE SUCKER							1								2											3	0	3	0.1
	LAKE CHUB		1						2								2		1					2			4	4	8	0.3
	SMELT																		1								1	0	1	0.0
	TOTAL		2	1	0	0	3	3	3	0	1	0	0	1	0	3	3	1	2	0	0	3	1	3	0	1	19	12	31	1.3

APPENDIX 6
FISH CATCH IN GILL NETS AT BRUCE GS "B", 1985
2.5cm MESH NETS

DATE	SPECIES	LOC	BRUCE A INTAKE				DOUGLAS POINT				BRUCE "B" DISCHARGE				BRUCE "B" INTAKE				HOLMES BAY				GUNN POINT				TOTAL			
		DEP	3		12		3		12		3		12		3		12		3		12		3		12		3	12	OVERALL	CUE
		SET	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2				
85/11/26	YELLOW PERCH								1																		0	1	1	0.0
	SMELT							2	2	1			1					1		1					2		3	7	10	0.3
	TOTAL		0	0	0	0	0	2	3	1	0	0	1	0	0	0	0	1	0	1	0	0	0	0	2	0	3	8	11	0.3
85/12/10	LAKE CHUB		1																1								2	0	2	0.1
	SMELT					1	1				2								3								6	1	7	0.3
	TOTAL		1	0	0	1	1	0	0	0	2	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	8	1	9	0.4

APPENDIX 7
FISH CATCH IN SEINE AT BRUCE GS "B", 1985

DATE 85/5/29	SPECIES	LOC	BRUCE "A" INTAKE			DOUGLAS POINT			BRUCE "B" INTAKE			INVERHURON BAY			HOLMES BAY			GLNN POINT			ALL S
		REP	1	2	3 total	1	2	3 total	1	2	3 total	1	2	3 total	1	2	3 total	1	2	3 total	
	LAMPREY				0			0			0			0			0			0	0
	ALEWIFE				0			0			0	1		1			0			0	1
	RAINBOW SMELT				0			0	1		1			3	3			0		1	1	6
	LONGNOSE DACE		1		1			0	12	23	3	38			2	2	10	1	3	14	7	12	11	30	85
	EMERALD SHINER			1	1			0			0	3	3	2	8	2	2	8	12	3	8	6	17	38
	SPOTTAIL SHINER				0		1	3	4	1		3	4	21		4	25			0	4	20	32	56	89
	LAKE CHUB				0			0		10		10				0			0		1	1	2	12
	BLUNTNOSE MINNOW				0			0			0				0			0			0	0
	LONGNOSE SUCKER				0			0			0				0			0			0	0
	WHITE SUCKER				0			0			0				0			0			0	0
	YELLOW PERCH				0			0			0				0			0			0	0
	FANTAIL DARTER				0			0			0				0		2	2			0	2
	JOHNNY DARTER				0		1	3	4			1	1	1	1	3	5		1	1			0	11
	IOWA DARTER				0			0			0				0			0			0	0
	SLIMY SCULPIN				0			0		2	2				0			0			0	2
	MOTTLED SCULPIN				0			0			0			1	1			0		1	1	2
	ROCK BASS				0			0			0				0			0			1	1
	TOTAL		1	1	0	2	0	2	4	8	14	35	8	57	26	4	15	45	12	4	13	29	14	42	52	108	230

APPENDIX 7
FISH CATCH IN SEINE AT BRUCE GS "B", 1985

DATE 85/6/26	SPECIES	LOC	BRUCE "A" INTAKE				DOUGLAS POINT				BRUCE "B" INTAKE				INVERHURON BAY				HOLMES BAY				GUNN POINT				TOTAL
		SET	1	2	3	total	1	2	3	total	1	2	3	total	1	2	3	total	1	2	3	total	1	2	3	total	
	LAMPREY					0				0		1		1				0				0				0	1
	ALEWIFE					0				0		1		1			4	4		1		1		1	1	2	8
	RAINBOW SMELT					0				0		1		1			2	2				0			1	1	4
	LONGNOSE DACE					0	1		5	6	18	5	12	35		1		1	9	26	19	54	4	5	7	16	112
	EMERALD SHINER					0				0	1			1		1		1		1		1				0	3
	SPOTTAIL SHINER		1	2	1	4		1	1	2	46	11	12	69	6	3	4	13	8	9	4	21	14	10	26	50	159
	LAKE CHUB					0				0				0				0				0				0	0
	BLUNTNOSE MINNOW					0				0				0				0		2		2		3	1	4	6
	LONGNOSE SUCKER					0				0				0				0				0		1		1	1
	WHITE SUCKER					0				0				0				0				0				0	0
	YELLOW PERCH					0				0				0				0				0				0	0
	FANTAIL DARTER					0				0				0				0		1		1				0	1
	JOHNNY DARTER					0			1	1		2		2			1	1	1		2	3				0	7
	IOWA DARTER					0				0				0				0			1	1				0	1
	SLIMY SCULPIN					0				0				0				0				0				0	0
	MOTTLED SCULPIN					0				0				0				0				0				0	0
	ROCK BASS					0				0				0				0				0				0	0
	TOTAL		1	2	1	4	1	1	7	9	65	21	24	110	6	5	11	22	18	40	26	84	18	20	36	74	231

APPENDIX 7
FISH CATCH IN SEINE AT BRUCE GS "B", 1985

DATE 85/7/23	SPECIES	LOC	BRUCE "A" INTAKE				DOUGLAS POINT				BRUCE "B" INTAKE				INVERHURON BAY				HOLMES BAY				GUNN POINT				TOTAL
		SET	1	2	3	total	1	2	3	total	1	2	3	total	1	2	3	total	1	2	3	total	1	2	3	total	
	LAMPREY					0				0				0				0				0				0	0
	ALEWIFE					0				0				0				0				0				0	0
	RAINBOW SMELT					0				0				0				0		1		1				0	1
	LONGNOSE DACE				4	4	2			2	15	3	7	25	2		2	4	16	11	3	30	16	13	6	35	100
	EMERALD SHINER					0				0				0	3	1	1	5				0				0	5
	SPOTTAIL SHINER				3	3				0	9		4	13	8	6	1	15	1			1	2	2	1	5	37
	LAKE CHUB					0				0			1	1				0				0				0	1
	JUVENILE CYPRINID					0				0	1		1	2				0	4	24	3	31				0	33
	LONGNOSE SUCKER					0				0				0				0				0				0	0
	WHITE SUCKER					0				0	1			1		1		1	1			1				0	3
	YELLOW PERCH					0				0	1			1				0				0				0	1
	FANTAIL DARTER					0				0				0				0				0				0	0
	JOHNNY DARTER					0				0				0				0	1			1				0	1
	IOWA DARTER					0				0				0				0				0				0	0
	SLIMY SCULPIN					0				0				0				0				0	1	1		2	2
	MOTTLED SCULPIN					0				0				0				0				0				0	0
	ROCK BASS					0				0				0				0				0				0	0
	TOTAL		0	0	7	7	2	0	0	2	27	3	13	43	13	8	4	25	23	36	6	65	19	16	7	42	179

APPENDIX 8
LARVAL FISH CATCH IN BRUCE "B" COMMISSIONING SURVEY, 1985
BENTHIC SLED TOWS

DATE APRIL 12,1985			SPECIES							
			SMELT eggs	BUBBOT eggs	BURBOT larvae	NORTHERN PIKE	DEEP WATER SCULPIN	total eggs	total larvae	TOTAL
LOCATION	DEPTH	SET								
BRUCE "B"	5m	1						0	0	0
INTAKE		2						0	0	0
	total		0	0	0	0	0	0	0	0
	7m	1						0	0	0
		2						0	0	0
	total		0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	0
BRUCE "B"	5m	1					2	0	2	2
DISCHARGE		2					2	0	2	2
	total		0	0	0	0	4	0	4	4
	7m	1					8	0	8	8
		2					16	0	16	16
	total		0	0	0	0	24	0	24	24
	TOTAL		0	0	0	0	28	0	28	28
HOLMES	3m	1						0	0	0
BAY		2						0	0	0
	total		0	0	0	0	0	0	0	0
	7m	1						0	0	0
		2					1	0	1	1
	total		0	0	0	0	1	0	1	1
	TOTAL		0	0	0	0	1	0	1	1
INVERHURON	3m	1					1	0	1	1
BAY		2						0	0	0
	total		0	0	0	0	1	0	1	1
	5m	1						0	0	0
		2		1				1	0	1
	total		0	1	0	0	0	1	0	1
	TOTAL		0	1	0	0	1	1	1	2
ALL SITES			0	1	0	0	30	1	30	31

APPENDIX 8
LARVAL FISH CATCH IN BRUCE "B" COMMISSIONING SURVEY, 1985
BENTHIC SLED TOWS

DATE APRIL 24,1985			SPECIES							
			SMELT eggs	BUBBOT eggs	BURBOT larvae	NORTHERN PIKE	DEEP WATER SCULPIN	total eggs	total larvae	TOTAL
LOCATION	DEPTH	SET								
BRUCE "B"	5m	1						0	0	0
INTAKE		2						0	0	0
	total		0	0	0	0	0	0	0	0
NO DATA	7m	1						0	0	0
		2						0	0	0
	total		0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	0
BRUCE "B"	5m	1	39	1				40	0	40
DISCHARGE		2	20	1	1			21	1	22
	total		59	2	1	0	0	61	1	62
	7m	1	47	9				56	0	56
		2	12	3			1	15	1	16
	total		59	12	0	0	1	71	1	72
	TOTAL		118	14	1	0	1	132	2	134
HOLMES	3m	1	2		1			2	1	3
BAY		2	2					2	0	2
	total		4	0	1	0	0	4	1	5
	7m	1	14					14	0	14
		2	12					12	0	12
	total		26	0	0	0	0	26	0	26
	TOTAL		30	0	1	0	0	30	1	31
INVERHURON	3m	1						0	0	0
BAY		2						0	0	0
	total		0	0	0	0	0	0	0	0
NO DATA	5m	1						0	0	0
		2						0	0	0
	total		0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	0
ALL SITES			148	14	2	0	1	162	3	165

APPENDIX 8
LARVAL FISH CATCH IN BRUCE "B" COMMISSIONING SURVEY, 1985
BENTHIC SLED TOWS

DATE APRIL 26,1985			SPECIES: SMELT eggs	BUBBOT eggs	BURBOT larvae	NORTHERN PIKE	DEEP WATER SCULPIN	total eggs	total larvae	TOTAL
LOCATION	DEPTH	SET								
BRUCE "B"	5m	1	25					25	0	25
INTAKE		2	20					20	0	20
	total		45	0	0	0	0	45	0	45
	7m	1	14					14	0	14
		2	3					3	0	3
	total		17	0	0	0	0	17	0	17
	TOTAL		62	0	0	0	0	62	0	62
BRUCE "B"	5m	1						0	0	0
DISCHARGE		2	9			1		9	1	10
	total		9	0	0	1	0	9	1	10
	7m	1	55					55	0	55
		2	165					165	0	165
	total		220	0	0	0	0	220	0	220
	TOTAL		229	0	0	1	0	229	1	230
HOLMES	3m	1	8					8	0	8
BAY		2	1					1	0	1
	total		9	0	0	0	0	9	0	9
	7m	1						0	0	0
		2						0	0	0
	total		0	0	0	0	0	0	0	0
	TOTAL		9	0	0	0	0	9	0	9
INVERHURON	3m	1						0	0	0
BAY		2						0	0	0
	total		0	0	0	0	0	0	0	0
NO DATA	5m	1						0	0	0
		2						0	0	0
	total		0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	0
ALL SITES			300	0	0	1	0	300	1	301

APPENDIX 9
LARVAL FISH CATCH IN BOTTOM TOWS
BRUCE "B" INTAKE, 1985

DATE	DEPTH	SET	SPECIES											
			ALEWIFE	BUBBOT	SMELT	ROUND WHITEFISH	LAKE WHITEFISH	CISCO	CYPRINID (unid.)	TROUT PERCH	YELLOW PERCH	DEEP WATER SCULPIN	SLIMY SCULPIN	TOTAL
85/05/22														
	7	1		3	2									5
		2		1	4									5
	total		0	4	6	0	0	0	0	0	0	0	0	10
	12	1		4	9							2		15
		2		17	5									22
	total		0	21	14	0	0	0	0	0	0	2	0	37
	16	1		9	6									15
		2		11	6									17
	total		0	20	12	0	0	0	0	0	0	0	0	32
	TOTAL		0	45	32	0	0	0	0	0	0	2	0	79
85/05/23														
	7	1		19	15									34
		2		8	16									24
	total		0	27	31	0	0	0	0	0	0	0	0	58
	12	1		20	7									27
		2		10	4									14
	total		0	30	11	0	0	0	0	0	0	0	0	41
	16	1												0
		2		25	3									28
	total		0	25	3	0	0	0	0	0	0	0	0	28
	TOTAL		0	82	45	0	0	0	0	0	0	0	0	127
85/06/03														
	7	1		2	2									4
		2		2										2
	total		0	4	2	0	0	0	0	0	0	0	0	6
	12	1		14	9									23
		2		6	2									8
	total		0	20	11	0	0	0	0	0	0	0	0	31
	16	1		8	8						1			17
		2		8	15									23
	total		0	16	23	0	0	0	0	0	1	0	0	40
														0
	TOTAL		0	40	36	0	0	0	0	0	1	0	0	77

APPENDIX 9
LARVAL FISH CATCH IN BOTTOM TOWS
BRUCE "B" INTAKE, 1985

DATE	DEPTH	SET	ALEWIFE	BUBBOT	SMELT	ROUND WHITEFISH	LAKE WHITEFISH	CISCO	CYPRINID (unid.)	TROUT PERCH	YELLOW PERCH	DEEP WATER SCULPIN	SLIMY SCULPIN	TOTAL
85/06/04														
	7	1		23	4	1								28
		2		21	12									33
	total		0	44	16	1	0	0	0	0	0	0	0	61
	12	1		16	7							1		24
		2		16	9									25
	total		0	32	16	0	0	0	0	0	0	1	0	49
	16	1		4	3									7
		2		13	11									24
	total		0	17	14	0	0	0	0	0	0	0	0	31
	TOTAL		0	93	46	1	0	0	0	0	0	1	0	141
85/06/19														
	7	1												0
		2		1										1
	total		0	1	0	0	0	0	0	0	0	0	0	1
	12	1												0
		2		1										1
	total		0	1	0	0	0	0	0	0	0	0	0	1
	16	1			2									2
		2		1	4									5
	total		0	1	6	0	0	0	0	0	0	0	0	7
	TOTAL		0	3	6	0	0	0	0	0	0	0	0	9
85/06/20														
	7	1												0
		2												0
	total		0	0	0	0	0	0	0	0	0	0	0	0
	12	1		1	6									7
		2			5									5
	total		0	1	11	0	0	0	0	0	0	0	0	12
	16	1												0
		2		2	9			1				1		13
	total		0	2	9	0	0	1	0	0	0	1	0	13
	TOTAL		0	3	20	0	0	1	0	0	0	1	0	25

APPENDIX 9
LARVAL FISH CATCH IN BOTTOM TOWS
BRUCE "B" INTAKE, 1985

DATE	DEPTH	SET	SPECIES											
			ALEWIFE	BUBBOT	SMELT	ROUND WHITEFISH	LAKE WHITEFISH	CISCO	CYPRINID (unid.)	TROUT PERCH	YELLOW PERCH	DEEP WATER SCULPIN	SLIMY SCULPIN	TOTAL
85/07/02														
	7	1												0
		2		2										2
	total		0	2	0	0	0	0	0	0	0	0	0	2
	12	1												0
		2												0
	total		0	0	0	0	0	0	0	0	0	0	0	0
	16	1												0
		2												0
	total		0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	2	0	0	0	0	0	0	0	0	0	2
85/07/04														
	7	1								3				3
		2									1			1
	total		0	0	0	0	0	0	0	3	1	0	0	4
	12	1												0
		2							1					1
	total		0	0	0	0	0	0	1	0	0	0	0	1
	16	1												0
		2					1		1					2
	total		0	0	0	0	1	0	1	0	0	0	0	2
	TOTAL		0	0	0	0	1	0	2	3	1	0	0	7
85/08/07														
	7	1	3											3
		2	1											1
	total		4	0	0	0	0	0	0	0	0	0	0	4
	12	1									1			1
		2	1								1		1	3
	total		1	0	0	0	0	0	0	0	2	0	1	4
	16	1												
		2	1		1						1			3
	total		1	0	1	0	0	0	0	0	1	0	0	3
	TOTAL		6	0	1	0	0	0	0	0	3	0	1	11

APPENDIX 9
LARVAL FISH CATCH IN BOTTOM TOWS
BRUCE "B" INTAKE, 1985

DATE	DEPTH	SET	SPECIES											
			ALEWIFE	BUBBOT	SMELT	ROUND WHITEFISH	LAKE WHITEFISH	CISCO	CYPRINID (unid.)	TROUT PERCH	YELLOW PERCH	DEEP WATER SCULPIN	SLIMY SCULPIN	TOTAL
85/08/08														
	7	1	5											5
		2												0
	total		5	0	0	0	0	0	0	0	0	0	0	5
	12	1												0
		2	4											4
	total		4	0	0	0	0	0	0	0	0	0	0	4
	16	1	2											2
		2												0
	total		2	0	0	0	0	0	0	0	0	0	0	2
	TOTAL		11	0	0	0	0	0	0	0	0	0	0	11

85/09/04 NO COLLECTIONS - STORMS

85/09/05 NO COLLECTIONS -STORMS

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE MAY 22,1985			SPECIES																
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
BRUCE "B" INTAKE	1	1					24												0	24	24
		2			3		46												0	49	49
	total		0	0	3	0	70	0	0	0	0	0	0	0	0	0	0	0	0	73	73
	3	1			1		33												0	34	34
		2					46												0	46	46
	total		0	0	1	0	79	0	0	0	0	0	0	0	0	0	0	0	0	80	80
	7	1					15												0	15	15
		2					62												0	62	62
	total		0	0	0	0	77	0	0	0	0	0	0	0	0	0	0	0	0	77	77
	TOTAL		0	0	4	0	226	0	0	0	0	0	0	0	0	0	0	0	0	230	230
BRUCE "B" DISCHARGE	1	1					19												0	19	19
		2					17												0	17	17
	total		0	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	36	36
	3	1					7												0	7	7
		2					15												0	15	15
	total		0	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	22	22
	7	1			1		30												0	31	31
		2					13												0	13	13
	total		0	0	1	0	43	0	0	0	0	0	0	0	0	0	0	0	0	44	44
	TOTAL		0	0	1	0	101	0	0	0	0	0	0	0	0	0	0	0	0	102	102
BRUCE "B" FOREBAY		1			3	3													3	3	6
		2			3														0	3	3
	TOTAL		0	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	3	6	9
BRUCE "A" INTAKE	1	1					76												0	76	76
		2					34												0	34	34
	total		0	0	0	0	110	0	0	0	0	0	0	0	0	0	0	0	0	110	110
	3	1					32												0	0	0
		2																	0	32	32
	total		0	0	0	0	32	0	0	0	0	0	0	0	0	0	0	0	0	32	32
	7	1					8												0	8	8
		2					28												0	28	28
	total		0	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	36	36
	TOTAL		0	0	0	0	178	0	0	0	0	0	0	0	0	0	0	0	0	178	178

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APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE MAY 22,1985			SPECIES																		
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
DOUGLAS POINT	1	1					36												0	36	36
		2					12												0	12	12
	total		0	0	0	0	48	0	0	0	0	0	0	0	0	0	0	0	0	48	48
	3	1			2		22												0	24	24
		2			2														0	2	2
	total		0	0	4	0	22	0	0	0	0	0	0	0	0	0	0	0	0	26	26
	7	1					9												0	9	9
		2					7												0	7	7
	total		0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	16	16
	TOTAL		0	0	4	0	86	0	0	0	0	0	0	0	0	0	0	0	0	90	90
SOUTH BOUNDARY POINT	1	1					47												0	47	47
		2					20												0	20	20
	total		0	0	0	0	67	0	0	0	0	0	0	0	0	0	0	0	0	67	67
	3	1			3		78												0	81	81
		2			4		82												0	86	86
	total		0	0	7	0	160	0	0	0	0	0	0	0	0	0	0	0	0	167	167
	7	1																	0	0	0
		2			1		20												0	21	21
	total		0	0	1	0	20	0	0	0	0	0	0	0	0	0	0	0	0	21	21
	TOTAL		0	0	8	0	247	0	0	0	0	0	0	0	0	0	0	0	0	255	255
HOLMES BAY	1	1					2				1								0	3	3
		2					16				1	1							0	18	18
	total		0	0	0	0	18	0	0	0	2	1	0	0	0	0	0	0	0	21	21
	3	1			1	1	26												1	27	28
		2					7												0	7	7
	total		0	0	1	1	33	0	0	0	0	0	0	0	0	0	0	0	1	34	35
	7	1					9												0	9	9
		2			2		8												0	10	10
	total		0	0	2	0	17	0	0	0	0	0	0	0	0	0	0	0	0	19	19
	TOTAL		0	0	3	1	68	0	0	0	2	1	0	0	0	0	0	0	1	74	75

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APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE MAY 22, 1985			SPECIES																		
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
GUNN POINT	1	1					7												0	7	7
		2					16												0	16	16
	total		0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	23	23
	3	1					35												0	35	35
		2					50												0	50	50
	total		0	0	0	0	85	0	0	0	0	0	0	0	0	0	0	0	0	85	85
	7	1			1		27												0	28	28
		2					20												0	20	20
	total		0	0	1	0	47	0	0	0	0	0	0	0	0	0	0	0	0	48	48
	TOTAL		0	0	1	0	155	0	0	0	0	0	0	0	0	0	0	0	0	156	156
INVERHURON BAY		1					10												0	10	10
		2					12												0	12	12
	total		0	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	22	22
	3	1				1	11												1	11	12
		2					10												0	10	10
	total		0	0	0	1	21	0	0	0	0	0	0	0	0	0	0	0	1	21	22
	7	1			1		5												0	6	6
		2					9												0	9	9
	total		0	0	1	0	14	0	0	0	0	0	0	0	0	0	0	0	0	15	15
	TOTAL		0	0	1	1	57	0	0	0	0	0	0	0	0	0	0	0	1	58	59
ALL SITES	1m		0	0	3	0	394	0	0	0	2	1	0	0	0	0	0	0	0	400	400
	3m		0	0	13	2	454	0	0	0	0	0	0	0	0	0	0	0	2	467	469
	7m		0	0	6	0	270	0	0	0	0	0	0	0	0	0	0	0	0	276	276
	all depths (+forebay)		0	0	28	5	1118	0	0	0	2	1	0	0	0	0	0	0	5	1149	1154

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APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE MAY23, 1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
BRUCE "B" INTAKE	1	1			4		48														
		2			2		48														
	total		0	0	2	0	96	0	0	0	0	0	0	0	0	0	0	0	0	52	52
	3	1			8	1	26												0	50	50
		2			2		52												0	98	98
	total		0	0	10	1	78	0	0	0	0	0	0	0	0	0	0	0	1	34	35
	7	1			18		58												0	54	54
		2			36		48												1	88	89
	total		0	0	54	0	106	0	0	0	0	0	0	0	0	0	0	0	0	76	76
	TOTAL		0	0	66	1	280	0	0	0	0	0	0	0	0	0	0	0	0	84	84
BRUCE "B" DISCHARGE	1	1					4												1	346	347
		2			8		20												0	4	4
	total		0	0	8	0	24	0	0	0	0	0	0	0	0	0	0	0	0	28	28
	5	1			4		70												0	32	32
		2			2		48												0	74	74
	total		0	0	6	0	118	0	0	0	0	0	0	0	0	0	0	0	0	50	50
	7	1			2		31	1											0	124	124
		2			4		42												0	34	34
	total		0	0	6	0	73	1	0	0	0	0	0	0	0	0	0	0	0	46	46
	TOTAL		0	0	20	0	215	1	0	0	0	0	0	0	0	0	0	0	0	80	80
BRUCE "B" FOREBAY		1			6														0	236	236
		2			10		2												0	6	6
	TOTAL		0	0	16	0	2	0	0	0	0	0	0	0	0	0	0	0	0	12	12
BRUCE "A" INTAKE	1	1					5												0	18	18
		2					6												0	5	5
	total		0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	6	6
	3	1			1		14												0	14	14
		2			4		45												0	15	15
	total		0	0	5	0	59	0	0	0	0	0	0	0	0	0	0	0	0	42	42
	7	1					4												0	64	64
		2					30												0	4	4
	total		0	0	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	30	30
	TOTAL		0	0	5	0	107	0	0	0	0	0	0	0	0	0	0	0	0	34	34
																			0	112	112

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE MAY 23,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
DOUGLAS POINT	1	1			10		190												0	200	200
		2			4	1	130												1	134	135
	total		0	0	14	1	320	0	0	0	0	0	0	0	0	0	0	0	1	334	335
	3	1			2	1	41												1	43	44
		2			6		78												0	84	84
	total		0	0	5	1	119	0	0	0	0	0	0	0	0	0	0	0	1	124	125
	7	1			5		7				1								0	12	12
		2			4		8												0	13	13
	total		0	0	9	0	15	0	0	0	1	0	0	0	0	0	0	0	0	25	25
	TOTAL		0	0	28	2	454	0	0	0	1	0	0	0	0	0	0	0	2	483	485
SOUTH BOUNDARY POINT	1	1			6		12												0	18	18
		2			6		12												0	18	18
	total		0	0	12	0	24	0	0	0	0	0	0	0	0	0	0	0	0	36	36
	3	1			5		16												0	21	21
		2			6		12												0	18	18
	total		0	0	11	0	28	0	0	0	0	0	0	0	0	0	0	0	0	39	39
	7	1			8		26												0	34	34
		2			7		26												0	33	33
	total		0	0	15	0	52	0	0	0	0	0	0	0	0	0	0	0	0	67	67
	TOTAL		0	0	38	0	104	0	0	0	0	0	0	0	0	0	0	0	0	142	142
HOLMES BAY	1	1			3		6				1								0	10	10
		2			1		3				1								0	5	5
	total		0	0	4	0	9	0	0	0	2	0	0	0	0	0	0	0	0	15	15
	3	1			1		2												0	3	3
		2			2		8												0	10	10
	total		0	0	3	0	10	0	0	0	0	0	0	0	0	0	0	0	0	13	13
	7	1			2		7												0	9	9
		2			10		5												0	15	15
	total		0	0	12	0	12	0	0	0	0	0	0	0	0	0	0	0	0	24	24
	TOTAL		0	0	19	0	31	0	0	0	2	0	0	0	0	0	0	0	0	52	52

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE MAY 23,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
GUNN POINT	1	1			3	3	30												3	33	36
		2					16												0	16	16
	total		0	0	3	3	46	0	0	0	0	0	0	0	0	0	0	0	3	49	52
	3	1			5		22			1									0	28	28
		2			6		16												0	22	22
	total		0	0	11	0	38	0	0	1	0	0	0	0	0	0	0	0	0	50	50
	7	1			1		47												0	48	48
		2			1		11												0	12	12
	total		0	0	2	0	58	0	0	0	0	0	0	0	0	0	0	0	0	60	60
	TOTAL		0	0	16	3	142	0	0	1	0	0	0	0	0	0	0	0	3	159	162
INVERHURON BAY		1			4		23			1									0	28	28
		2			1		11												0	12	12
	total		0	0	5	0	34	0	0	1	0	0	0	0	0	0	0	0	0	40	40
	3	1			1		27												0	28	28
		2			1		24												0	25	25
	total		0	0	2	0	51	0	0	0	0	0	0	0	0	0	0	0	0	53	53
	7	1			3		27			1									0	31	31
		2					14												0	14	14
	total		0	0	3	0	41	0	0	1	0	0	0	0	0	0	0	0	0	45	45
	TOTAL		0	0	10	0	126	0	0	2	0	0	0	0	0	0	0	0	0	138	138
ALL SITES	1m		0	0	48	4	567	0	0	1	2	0	0	0	0	0	0	0	4	618	622
	3m		0	0	53	2	501	0	0	1	0	0	0	0	0	0	0	0	2	555	557
	7m		0	0	101	0	391	1	0	1	1	0	0	0	0	0	0	0	0	495	495
	all depths		0	0	218	6	1461	1	0	3	3	0	0	0	0	0	0	0	6	1680	1692

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JUNE 3,1985			SPECIES																		
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
BRUCE "B" INTAKE	1	1			3		11												0	14	14
		2			7		12												0	19	19
	total		0	0	10	0	23	0	0	0	0	0	0	0	0	0	0	0	0	33	33
	3	1			7		11												0	18	18
		2			9		25												0	34	34
	total		0	0	16	0	36	0	0	0	0	0	0	0	0	0	0	0	0	52	52
	7	1			1		12												0	13	13
		2			1		10												0	11	11
	total		0	0	2	0	22	0	0	0	0	0	0	0	0	0	0	0	0	24	24
	TOTAL		0	0	28	0	81	0	0	0	0	0	0	0	0	0	0	0	0	109	109
BRUCE "B" DISCHARGE	1	1			2		2												0	4	4
		2			1		2												0	3	3
	total		0	0	3	0	4	0	0	0	0	0	0	0	0	0	0	0	0	7	7
	3	1			4		6												0	10	10
		2					3												0	3	3
	total		0	0	4	0	9	0	0	0	0	0	0	0	0	0	0	0	0	13	13
	7	1			2		8												0	10	10
		2			4		7												0	11	11
	total		0	0	6	0	15	0	0	0	0	0	0	0	0	0	0	0	0	21	21
	TOTAL		0	0	13	0	28	0	0	0	0	0	0	0	0	0	0	0	0	41	41
BRUCE "B" FOREBAY		1			7	1	1												1	8	9
		2			8														0	8	8
	TOTAL		0	0	15	1	1	0	0	0	0	0	0	0	0	0	0	0	1	16	17
BRUCE "A" INTAKE	1	1			1		3												0	4	4
		2																	0	0	0
	total		0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	4	4
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1			2		7												0	9	9
		2																	0	0	0
	total		0	0	2	0	7	0	0	0	0	0	0	0	0	0	0	0	0	9	9
	TOTAL		0	0	3	0	10	0	0	0	0	0	0	0	0	0	0	0	0	13	13

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APPENDIX TO
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JUNE 3,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
DOUGLAS POINT	1	1			1		5												0	6	6
		2			10		7												0	17	17
	total		0	0	11	0	12	0	0	0	0	0	0	0	0	0	0	0	0	23	23
	3	1			6		11												0	17	17
		2			5		6												0	11	11
	total		0	0	11	0	17	0	0	0	0	0	0	0	0	0	0	0	0	28	28
	7	1			3		2												0	5	5
		2			9		2							1					0	12	12
	total		0	0	12	0	4	0	0	0	0	0	0	1	0	0	0	0	0	17	17
	TOTAL		0	0	34	0	33	0	0	0	0	0	0	1	0	0	0	0	0	68	68
SOUTH BOUNDARY POINT	1	1			22		18												0	40	40
		2			21		11												0	32	32
	total		0	0	43	0	29	0	0	0	0	0	0	0	0	0	0	0	0	72	72
	3	1			52		38												0	90	90
		2			75		58												0	133	133
	total		0	0	127	0	96	0	0	0	0	0	0	0	0	0	0	0	0	223	223
	7	1			20		48												0	68	68
		2			50		45												0	95	95
	total		0	0	70	0	93	0	0	0	0	0	0	0	0	0	0	0	0	163	163
	TOTAL		0	0	240	0	218	0	0	0	0	0	0	0	0	0	0	0	0	458	458
HOLMES BAY	1	1			8		4												0	12	12
		2			16		10												0	26	26
	total		0	0	24	0	14	0	0	0	0	0	0	0	0	0	0	0	0	38	38
	3	1			14		44												0	58	58
		2			11		25												0	36	36
	total		0	0	25	0	69	0	0	0	0	0	0	0	0	0	0	0	0	94	94
	7	1			8		32												0	40	40
		2			13		11												0	24	24
	total		0	0	21	0	43	0	0	0	0	0	0	0	0	0	0	0	0	64	64
	TOTAL		0	0	70	0	126	0	0	0	0	0	0	0	0	0	0	0	0	196	196

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APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JUNE 3,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
GUNN POINT	1	1			3		8												0	11	11
		2			4		6												0	10	10
	total		0	0	7	0	14	0	0	0	0	0	0	0	0	0	0	0	0	21	21
	3	1					12												0	12	12
		2			2		18												0	20	20
	total		0	0	2	0	30	0	0	0	0	0	0	0	0	0	0	0	0	32	32
	7	1			12		25												0	37	37
		2			8		27												0	35	35
	total		0	0	20	0	52	0	0	0	0	0	0	0	0	0	0	0	0	72	72
	TOTAL		0	0	29	0	96	0	0	0	0	0	0	0	0	0	0	0	0	125	125
INVERHURON BAY		1			2		11												0	13	13
		2			5		4												0	9	9
	total		0	0	7	0	15	0	0	0	0	0	0	0	0	0	0	0	0	22	22
	3	1			2		14												0	16	16
		2			1		7												0	8	8
	total		0	0	3	0	21	0	0	0	0	0	0	0	0	0	0	0	0	24	24
	7	1					6												0	6	6
		2					6												0	6	6
	total		0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	12	12
	TOTAL		0	0	10	0	48	0	0	0	0	0	0	0	0	0	0	0	0	58	58
ALL SITES	1m		0	0	106	0	114	0	0	0	0	0	0	0	0	0	0	0	0	220	220
	3m		0	0	188	0	278	0	0	0	0	0	0	0	0	0	0	0	0	466	466
	7m		0	0	133	0	248	0	0	0	0	0	0	1	0	0	0	0	0	382	382
	all depths (+forebay)		0	0	442	1	641	0	0	0	0	0	0	1	0	0	0	0	1	1084	1085

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JUNE 4,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
BRUCE "B" INTAKE	1	1			2		25												0	27	27
		2			7		15												0	22	22
		total	0	0	9	0	40	0	0	0	0	0	0	0	0	0	0	0	0	49	49
	3	1			15		27												0	42	42
		2			8		42												0	50	50
		total	0	0	23	0	69	0	0	0	0	0	0	0	0	0	0	0	0	92	92
	7	1			21		10												0	31	31
		2			26		2												0	28	28
		total	0	0	47	0	12	0	0	0	0	0	0	0	0	0	0	0	0	59	59
		TOTAL	0	0	79	0	121	0	0	0	0	0	0	0	0	0	0	0	0	200	200
BRUCE "B" DISCHARGE	1	1			1		6				1								0	8	8
		2			3		3												0	6	6
		total	0	0	4	0	9	0	0	0	1	0	0	0	0	0	0	0	0	14	14
	3	1																	0	0	0
		2					1												0	1	1
		total	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
	7	1																	0	0	0
		2			2		5												0	7	7
		total	0	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0	0	7	7
		TOTAL	0	0	6	0	15	0	0	0	1	0	0	0	0	0	0	0	0	22	22
BRUCE "B" FOREBAY		1			5														0	5	5
		2			3														0	3	3
		TOTAL	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	8
BRUCE "A" INTAKE	1	1					3												0	3	3
		2					3												0	3	3
		total	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6	6
	3	1																	0	0	0
		2					1												0	1	1
		total	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
	7	1					1												0	1	1
		2					1												0	1	1
		total	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2
		TOTAL	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	9	9

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APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JUNE 4,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
DOUGLAS POINT	1	1					7														
		2			1		5												0	7	7
	total		0	0	1	0	12	0	0	0	0	0	0	0	0	0	0	0	0	6	6
	3	1					2												0	13	13
		2					3												0	2	2
	total		0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	3	3
	7	1			1		10												0	5	5
		2			1		6												0	11	11
	total		0	0	2	0	16	0	0	0	0	0	0	0	0	0	0	0	0	7	7
	TOTAL		0	0	3	0	33	0	0	0	0	0	0	0	0	0	0	0	0	18	18
SOUTH BOUNDARY POINT	1	1			29		37												0	36	36
		2			1		2												0	66	66
	total		0	0	30	0	39	0	0	0	0	0	0	0	0	0	0	0	0	3	3
	3	1			40		46												0	69	69
		2			54		57												0	86	86
	total		0	0	94	0	103	0	0	0	0	0	0	0	0	0	0	0	0	111	111
	7	1			54		43												0	197	197
		2			74		34												0	97	97
	total		0	0	128	0	77	0	0	0	0	0	0	0	0	0	0	0	0	108	108
	TOTAL		0	0	252	0	219	0	0	0	0	0	0	0	0	0	0	0	0	205	205
HOLMES BAY	1	1			17		8												0	471	471
		2			10		26												0	25	25
	total		0	0	27	0	34	0	0	0	0	0	0	0	0	0	0	0	0	36	36
	3	1			3		18				1								0	61	61
		2			11		20												0	22	22
	total		0	0	14	0	38	0	0	0	1	0	0	0	0	0	0	0	0	31	31
	7	1			10		39	1											0	53	53
		2			19		39												0	50	50
	total		0	0	29	0	78	1	0	0	0	0	0	0	0	0	0	0	0	58	58
	TOTAL		0	0	70	0	150	1	0	0	1	0	0	0	0	0	0	0	0	222	222

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JUNE 4,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
GUNN POINT	1	1			4		11												0	15	15
		2			8		33												0	41	41
	total		0	0	12	0	44	0	0	0	0	0	0	0	0	0	0	0	0	56	56
	3	1			3		21												0	24	24
		2			5		17												0	22	22
	total		0	0	8	0	38	0	0	0	0	0	0	0	0	0	0	0	0	46	46
	7	1			5		25												0	30	30
		2			7		14												0	21	21
	total		0	0	12	0	39	0	0	0	0	0	0	0	0	0	0	0	0	51	51
	TOTAL		0	0	32	0	121	0	0	0	0	0	0	0	0	0	0	0	0	153	153
INVERHURON BAY		1			1		19												0	20	20
		2			5		20			1									0	26	26
	total		0	0	6	0	39	0	0	1	0	0	0	0	0	0	0	0	0	46	46
	3	1			7		35												0	42	42
		2			2		32												0	34	34
	total		0	0	9	0	67	0	0	0	0	0	0	0	0	0	0	0	0	76	76
	7	1			3		12												0	15	15
		2			7		42												0	49	49
	total		0	0	10	0	54	0	0	0	0	0	0	0	0	0	0	0	0	64	64
	TOTAL		0	0	25	0	160	0	0	1	0	0	0	0	0	0	0	0	0	186	186
ALL SITES	1m		0	0	89	0	223	0	0	1	1	0	0	0	0	0	0	0	0	314	314
	3m		0	0	148	0	322	0	0	0	1	0	0	0	0	0	0	0	0	471	471
	7m		0	0	230	0	283	1	0	0	0	0	0	0	0	0	0	0	0	514	514
	all depths		0	0	475	0	828	1	0	1	2	0	0	0	0	0	0	0	0	1307	1307

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JUNE 19,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
BRUCE "B" INTAKE	1	1																4	0	4	4
		2																1	0	1	1
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	5
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2																	0	0	0
	total																		0	0	0
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRUCE "B" DISCHARGE	1	1																5	0	5	5
		2																1	0	1	1
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
	3	1																2	0	2	2
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	2
	7	1		2	1		1							1				1	0	2	2
		2		1															0	4	4
	total		0	3	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	2	2
	TOTAL		0	3	1	0	1	0	0	0	0	0	0	2	0	0	0	3	0	6	6
BRUCE "B" FOREBAY		1			1														0	10	10
		2																	0	1	1
	TOTAL		0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRUCE "A" INTAKE	1	1																	0	1	1
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1					1												0	0	0
		2																	0	1	1
	total																		0	0	0
	TOTAL		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JUNE 19,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
DOUGLAS POINT	1	TOO ROUGH																	0	0	0
																			0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2												1					0	1	1
	total		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
SOUTH BOUNDARY POINT	1	TOO ROUGH																	0	0	0
																			0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1					1							1					0	2	2
		2																	0	0	0
	total		0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	2	2
	TOTAL		0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	2	2
HOLMES BAY	1	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2								1									0	1	1
	total		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
	7	1								1									0	1	1
		2																	0	0	0
	total		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
	TOTAL		0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	2

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JUNE 19,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
GUNN POINT	1	TOO ROUGH																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1								0									0	0	0
		2								1									0	1	1
	total		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
INVERHURON BAY		1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL SITES	1m		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	7
	3m		0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	3	3
	7m		0	3	1	0	3	0	0	2	0	0	0	3	0	0	0	0	0	12	12
	all depths (+forebay)		0	3	2	0	3	0	0	3	0	0	0	4	0	0	0	8	0	23	23

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APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JUNE 20,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
BRUCE "B" INTAKE	1	1					1											2	0	3	3
		2																1	0	1	1
	total		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	4	4
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	4	4
BRUCE "B" DISCHARGE	1	1																	0	0	0
		2								1									0	1	1
	total		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
BRUCE "B" FOREBAY		1																	0	0	0
		2																	0	0	0
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRUCE "A" INTAKE	1	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1					0												0	0	0
		2					1												0	1	1
	total		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
	TOTAL		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JUNE 20,1985			SPECIES																		
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
DOUGLAS POINT	1	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH BOUNDARY POINT	1	1					2												0	2	2
		2					1												0	1	1
	total		0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3
	3	1																	0	0	0
		2					1												0	1	1
	total		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
	7	1																	0	1	1
		2					1			1									0	0	0
	total		0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2	2
	TOTAL		0	0	0	0	5	0	0	1	0	0	0	0	0	0	0	0	0	6	6
HOLMES BAY	1	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1					0												0	0	0
		2					1												0	1	1
	total		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
	TOTAL		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JUNE 20,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
GLANN POINT	1	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1				4													4	0	4
		2																	0	0	0
	total		0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
	TOTAL		0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
INVERHURON BAY		1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL SITES	1m		0	0	0	0	4	0	0	1	0	0	0	0	0	0	0	3	0	8	8
	3m		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
	7m		0	0	0	4	3	0	0	1	0	0	0	0	0	0	0	0	4	4	8
	all depths		0	0	0	4	8	0	0	2	0	0	0	0	0	0	0	3	4	13	17

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APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JULY 2,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
BRUCE "B" INTAKE	1	1								3									0	3	3
		2																	0	0	0
	total		0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	3
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	3
BRUCE "B" DISCHARGE	1	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRUCE "B" FOREBAY		1																	0	0	0
		2																	0	0	0
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRUCE "A" INTAKE	1	1								6									0	6	6
		2								6									0	6	6
	total		0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	12	12
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	12	12

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JULY 2,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
DOUGLAS POINT	1	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1								1									0	1	1
		2																	0	0	0
	total		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
SOUTH BOUNDARY POINT	1	1																	0	0	0
		2					1			1									0	2	2
	total		0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2	2
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2	2
HOLMES BAY	1	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JULY 2, 1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
GUNN POINT	1	1								1									0	1	1
		2								1									0	1	1
	total		0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	2
	3	1																	0	0	0
		2																1	0	1	1
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
	7	1																1	0	1	1
		2																1	0	1	1
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
	TOTAL		0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0	5	5
INVERHURON BAY		1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL SITES	1m		0	0	0	0	1	0	0	18	0	0	0	0	0	0	0	0	0	19	19
	3m		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2	2
	7m		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
	all depths (+forebay)		0	0	0	0	1	0	0	19	0	0	0	0	0	0	0	3	0	23	23

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JULY 4,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
BRUCE "B" INTAKE	1	TOO ROUGH																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1														5			0	5	5
		2														2			0	2	2
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	7	7
	7	1														2		1	0	3	3
		2														1			0	1	1
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	4	4
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	1	0	11	11
BRUCE "B" DISCHARGE	1	1		1															0	1	1
		2		7												1		1	0	9	9
	total		0	8	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	10	10
	3	1	12													2			12	2	14
		2	9		1													1	9	2	11
	total		21	0	1	0	0	0	0	0	0	0	0	0	0	2	0	1	21	4	25
	7	1						1											0	1	1
		2	5																5	0	5
	total		5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	5	1	6
	TOTAL		26	8	1	0	0	1	0	0	0	0	0	0	0	3	0	2	26	15	41
BRUCE "B" FOREBAY		1																	0	0	0
		2																	0	0	0
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRUCE "A" INTAKE	1	1		22						6			2				3		3	30	33
		2		24						9			2				4		4	35	39
	total		0	46	0	0	0	0	0	15	0	0	4	0	0	0	7	0	7	65	72
	3	1		2									1						0	3	3
		2	17	1													2		19	1	20
	total		17	3	0	0	0	0	0	0	0	0	1	0	0	0	2	0	19	4	23
	7	1								8				1				1	0	10	10
		2	9										1				1	3	10	4	14
	total		9	0	0	0	0	0	0	8	0	0	1	1	0	0	1	4	10	14	24
	TOTAL		26	49	0	0	0	0	0	23	0	0	6	1	0	0	10	4	36	83	119

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JULY 4,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
DOUGLAS POINT	1	1	1	3	1				3										1	7	8
		2	2	27	1													1	2	29	31
	total		3	30	2	0	0	0	3	0	0	0	0	0	0	0	0	1	3	36	39
	3	1		1	2													2	0	5	5
		2								1								2	0	3	3
	total		0	1	2	0	0	0	0	1	0	0	0	0	0	0	0	4	0	8	8
	7	1																1	0	1	1
		2														4			0	4	4
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	5	5
	TOTAL		3	31	4	0	0	0	3	1	0	0	0	0	0	4	0	6	3	49	52
SOUTH BOUNDARY POINT	1	TOO ROUGH																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1	50													7			50	7	57
		2	12													1			12	1	13
	total		62	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	62	8	70
	7	1	4							1						22			4	23	27
		2																	0	0	0
	total		4	0	0	0	0	0	0	1	0	0	0	0	0	22	0	0	4	23	27
	TOTAL		66	0	0	0	0	0	0	1	0	0	0	0	0	30	0	0	66	31	97
HOLMES BAY	1	1											1		6			1	0	8	8
		2	5	1											2			2	5	5	10
	total		5	1	0	0	0	0	0	0	0	0	1	0	8	0	0	3	5	13	18
	3	1														3			0	3	3
		2														1			0	1	1
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	4
	7	1					1												0	1	1
		2																	0	0	0
	total		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
	TOTAL		5	1	0	0	1	0	0	0	0	0	1	0	8	4	0	3	5	18	23

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE JULY 4,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
GUNN POINT	1	TOO ROUGH	o																0	0	0
																			0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1	13											33				1	13	34	47
		2	19											30					19	30	49
	total		32	0	0	0	0	0	0	0	0	0	0	63	0	0	0	1	32	64	96
	7	1												3				2	0	5	5
		2	4											4					4	4	8
	total		4	0	0	0	0	0	0	0	0	0	0	7	0	0	0	2	4	9	13
	TOTAL		36	0	0	0	0	0	0	0	0	0	0	70	0	0	0	3	36	73	109
INVERHURON BAY		1														7			0	7	7
		2	2				1									5			2	6	8
	total		2	0	0	0	1	0	0	0	0	0	0	0	0	12	0	0	2	13	15
	3	1	1																1	0	1
		2																	0	0	0
	total		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
	7	1		1											2				0	3	3
		2														5			0	5	5
	total		0	1	0	0	0	0	0	0	0	0	0	0	2	5	0	0	0	8	8
	TOTAL		3	1	0	0	1	0	0	0	0	0	0	0	2	17	0	0	3	21	24
ALL SITES	1m		10	85	2	0	1	0	3	15	0	0	5	0	8	13	7	5	17	137	154
	3m		133	4	3	0	0	0	0	1	0	0	1	63	0	21	2	6	135	99	234
	7m		22	1	0	0	1	1	0	9	0	0	1	8	2	34	1	8	23	65	88
	all depths		165	90	5	0	2	1	3	25	0	0	7	71	10	68	10	19	175	301	476

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APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE AUGUST 7,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
BRUCE "B" INTAKE	1	1		90									1		1				0	92	92
		2		5									1	1					0	7	7
	total		0	95	0	0	0	0	0	0	0	0	2	1	1	0	0	0	0	99	99
	3	1					1												0	1	1
		2		22						1			1						0	24	24
	total		0	22	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	25	25
	7	1		4			1												0	5	5
		2		2						1									0	3	3
	total		0	6	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	8	8
	TOTAL		0	123	0	0	2	0	0	2	0	0	3	1	1	0	0	0	0	132	132
BRUCE "B" DISCHARGE	1	1											1	1	5				0	7	7
		2		19									1						0	20	20
	total		0	19	0	0	0	0	0	0	0	0	2	1	5	0	0	0	0	27	27
	3	1		15										1	2				0	18	18
		2		23											2				0	25	25
	total		0	38	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	43	43
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	57	0	0	0	0	0	0	0	0	2	2	9	0	0	0	0	70	70
BRUCE "B" FOREBAY		1																	0	0	0
		2																1	0	1	1
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
BRUCE "A" INTAKE	1	1		11									6		6				0	23	23
		2		5									2		6				0	13	13
	total		0	16	0	0	0	0	0	0	0	0	8	0	12	0	0	0	0	36	36
	3	1		23											3				0	26	26
		2		43									2						0	45	45
	total		0	66	0	0	0	0	0	0	0	0	2	0	3	0	0	0	0	71	71
	7	1		18									2						0	20	20
		2		11											1				0	12	12
	total		0	29	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	32	32
	TOTAL		0	111	0	0	0	0	0	0	0	0	12	0	16	0	0	0	0	139	139

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE AUGUST 7,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
DOUGLAS POINT	1	1		32									1		11				0	44	44
		2		35											3				0	38	38
	total		0	67	0	0	0	0	0	0	0	0	1	0	14	0	0	0	0	82	82
	3	1		82									1		2				0	85	85
		2		43											1				0	44	44
	total		0	125	0	0	0	0	0	0	0	0	1	0	3	0	0	0	0	129	129
	7	1		21											1				0	22	22
		2		17											2				0	19	19
	total		0	38	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	41	41
	TOTAL		0	230	0	0	0	0	0	0	0	0	2	0	20	0	0	0	0	252	252
SOUTH BOUNDARY POINT	1	1		18											4				0	22	22
		2		9											3				0	12	12
	total		0	27	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	34	34
	3	1		10			1								2				0	13	13
		2		15						1					2				0	18	18
	total		0	25	0	0	1	0	0	1	0	0	0	0	4	0	0	0	0	31	31
	7	1		6											1				0	7	7
		2		11											2				0	13	13
	total		0	17	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	20	20
	TOTAL		0	69	0	0	1	0	0	1	0	0	0	0	14	0	0	0	0	85	85
HOLMES BAY	1	1		12						2									0	14	14
		2		13						5									0	18	18
	total		0	25	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	32	32
	3	1		49											1				0	50	50
		2		60											4				0	64	64
	total		0	109	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	114	114
	7	1		49											2				0	51	51
		2		56											1				0	57	57
	total		0	105	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	108	108
	TOTAL		0	239	0	0	0	0	0	7	0	0	0	0	8	0	0	0	0	254	254

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE AUGUST 7, 1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
GUNN POINT	1	1		15						1					1				0	17	17
		2		3									1						0	4	4
	total		0	18	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	21	21
	3	1		2															0	2	2
		2		6															0	6	6
	total		0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	8
	7	1		3															0	3	3
		2		1															0	1	1
	total		0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4
	TOTAL		0	30	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	33	33
INVERHURON BAY		1		13						2									0	15	15
		2		13						1									0	14	14
	total		0	26	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	29	29
	3	1		7						1									0	8	8
		2		12															0	12	12
	total		0	19	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	20	20
	7	1		8															0	8	8
		2		6															0	6	6
	total		0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	14
	TOTAL		0	59	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	63	63
ALL SITES	1m		0	293	0	0	0	0	0	11	0	0	14	2	40	0	0	0	0	360	360
	3m		0	412	0	0	2	0	0	3	0	0	4	1	19	0	0	0	0	441	441
	7m		0	213	0	0	1	0	0	1	0	0	2	0	10	0	0	0	0	227	227
	all depths (+forebay)		0	918	0	0	3	0	0	15	0	0	20	3	69	0	0	1	0	1029	1029

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1935
SURFACE LARVAL TOWS

DATE AUGUST 8,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
BRUCE "B" INTAKE	1	1		14															0	14	14
		2		17									1		1				0	19	19
	total		0	31	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	33	33
	3	1		15											1				0	16	16
		2		19									5						0	24	24
	total		0	34	0	0	0	0	0	0	0	0	5	0	1	0	0	0	0	40	40
	7	1		29									3						0	32	32
		2		13															0	13	13
	total		0	42	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	45	45
	TOTAL		0	107	0	0	0	0	0	0	0	0	9	0	2	0	0	0	0	118	118
BRUCE "B" DISCHARGE	1	1		71											3				0	74	74
		2		45											4				0	49	49
	total		0	116	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	123	123
	3	1		14											3				0	17	17
		2		14									1		4				0	19	19
	total		0	28	0	0	0	0	0	0	0	0	1	0	7	0	0	0	0	36	36
	7	1		6															0	6	6
		2		10															0	10	10
	total		0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	16
	TOTAL		0	160	0	0	0	0	0	0	0	0	1	0	14	0	0	0	0	175	175
BRUCE "B" FOREBAY		1																	0	0	0
		2																	0	0	0
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRUCE "A" INTAKE	1	1		14									2						0	16	16
		2		6															0	6	6
	total		0	20	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	22	22
	3	1		20									1						0	21	21
		2		5									1						0	6	6
	total		0	25	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	27	27
	7	1		3									1						0	4	4
		2		1											1				0	2	2
	total		0	4	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	6	6
	TOTAL		0	49	0	0	0	0	0	0	0	0	5	0	1	0	0	0	0	55	55

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE AUGUST 8, 1985			SPECIES																		
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
DOUGLAS POINT	1	1		21									3		2				0	26	26
		2		24											2				0	26	26
	total		0	45	0	0	0	0	0	0	0	0	3	0	4	0	0	0	0	52	52
	3	1		14															0	14	14
		2		26											2				0	28	28
	total		0	40	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	42	42
	7	1		1															0	1	1
		2		10															0	10	10
	total		0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	11
	TOTAL		0	96	0	0	0	0	0	0	0	0	3	0	6	0	0	0	0	105	105
SOUTH BOUNDARY POINT	1	1		15									1						0	16	16
		2		13									1						0	14	14
	total		0	28	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	30	30
	3	1		11									1						0	12	12
		2		1											2				0	3	3
	total		0	12	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	15	15
	7	1		15									1		3				0	19	19
		2		16									1						0	17	17
	total		0	31	0	0	0	0	0	0	0	0	2	0	3	0	0	0	0	36	36
	TOTAL		0	71	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	81	81
HOLMES BAY	1	1		92						3					3				0	98	98
		2		100						3									0	103	103
	total		0	192	0	0	0	0	0	6	0	0	0	0	3	0	0	0	0	201	201
	3	1		57											6				0	63	63
		2		29											3				0	32	32
	total		0	86	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	95	95
	7	1		124											9				0	133	133
		2		152									1						0	153	153
	total		0	276	0	0	0	0	0	0	0	0	1	0	9	0	0	0	0	286	286
	TOTAL		0	554	0	0	0	0	0	6	0	0	1	0	21	0	0	0	0	582	582

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE AUGUST 8,1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
GUNN POINT	1	1		4									4						0	8	8
		2		4									4						0	8	8
	total		0	8	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	16	16
	3	1		2									1		3				0	6	6
		2											5		5				0	10	10
	total		0	2	0	0	0	0	0	0	0	0	6	0	8	0	0	0	0	16	16
	7	1		4											9				0	13	13
		2		8											21				0	29	29
	total		0	12	0	0	0	0	0	0	0	0	0	0	30	0	0	0	0	42	42
	TOTAL		0	22	0	0	0	0	0	0	0	0	14	0	38	0	0	0	0	74	74
INVERHURON BAY		1		27															0	27	27
		2		30											1				0	31	31
	total		0	57	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	58	58
	3	1		32						2					1				0	35	35
		2		31											1				0	32	32
	total		0	63	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	67	67
	7	1		31											2				0	33	33
		2		12															0	12	12
	total		0	43	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	45	45
	TOTAL		0	163	0	0	0	0	0	2	0	0	0	0	5	0	0	0	0	170	170
ALL SITES	1m		0	497	0	0	0	0	0	6	0	0	16	0	16	0	0	0	0	535	535
	3m		0	290	0	0	0	0	0	2	0	0	15	0	31	0	0	0	0	338	338
	7m		0	435	0	0	0	0	0	0	0	0	7	0	45	0	0	0	0	487	487
	all depths (+forebay)		0	1222	0	0	0	0	0	8	0	0	38	0	92	0	0	0	0	1360	1360

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE SEPTEMBER 4,1985			SPECIES																		
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
BRUCE "B" INTAKE	1	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRUCE "B" DISCHARGE	1	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1		1															0	1	1
		2		1															0	1	1
	total		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
BRUCE "B" FOREBAY		1																	0	0	0
		2																	0	0	0
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRUCE "A" INTAKE	1	1		1															0	1	1
		2		1															0	1	1
	total		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
	3	1		2															0	2	2
		2																	0	0	0
	total		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
	7	1		2															0	2	2
		2																	0	0	0
	total		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
	TOTAL		0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE SEPTEMBER 4,1985			SPECIES																		
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
DOUGLAS POINT	1	1					1												0	1	1
		2					1												0	1	1
	total		0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2
	3	1					1												0	1	1
		2																	0	0	0
	total		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
	7	1		2															0	2	2
		2																	0	0	0
	total		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
	TOTAL		0	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	5	5
SOUTH BOUNDARY POINT	1	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HOLMES BAY	1	1								1									0	1	1
		2																	0	0	0
	total		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
	3	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE SEEPTEMBER 4, 1985			SPECIES																	
LOCATION	DEPTH	SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP	CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
GUNN POINT	1	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	1		1			1												0	2	2
		2		2															0	2	2
	total		0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4	4
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4	4
INVERHURON BAY		1					1			2									0	0	0
		2					1			2									0	3	3
	total		0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	3	3
	3	1								2									0	2	2
		2																	0	0	0
	total		0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	2
	7	1																	0	0	0
		2																	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		0	0	0	0	1	0	0	4	0	0	0	0	0	0	0	0	0	5	5
ALL SITES	1m		0	2	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	8	8
	3m		0	7	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	11	11
	7m		0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4
	all depths (+forebay)		0	13	0	0	5	0	0	5	0	0	0	0	0	0	0	0	0	23	23

APPENDIX 10
LARVAL FISH CATCH IN BRUCE GS "B" COMMISSIONING SURVEY, 1985
SURFACE LARVAL TOWS

DATE SEPTEMBER 5,1985		SPECIES																	
LOCATION	DEPTH SET	ALEWIFE egg	ALEWIFE larvae	BURBOT larvae	SMELT egg	SMELT larvae	ROUND WHITEFISH	CARP CYPRINID (unid.)	WHITE SUCKER	LONGNOSE SUCKER	TROUT PERCH	YELLOW PERCH	JOHNNY DARTER	PERCID (unid.)	SLIMY SCULPIN eggs	SLIMY SCULPIN larvae	total eggs	total larvae	TOTAL
BRUCE "B"SURFA	1															1	0	1	1
FOREBAY	2																0	0	0
TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1

TOO ROUGH FOR OTHER SAMPLES